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# INTERNATIONAL CLINICS:

A QUARTERLY OF CLINICAL LECTURES

ON

MEDICINE, SURGERY, GYNÆCOLOGY, PEDIATRICS,  
NEUROLOGY, DERMATOLOGY, LARYNGOLOGY,  
OPHTHALMOLOGY, AND OTOTOLOGY,

BY

PROFESSORS AND LECTURERS IN THE LEADING MEDICAL  
COLLEGES OF THE UNITED STATES, GREAT  
BRITAIN, AND CANADA:

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Epidermis shed from hands and soles of Dr. Blanc's case. The only rupture of the gloves occurred when the hands were withdrawn.



Epidermic glove removed almost complete from Dr. Blanc's case of erythema exfoliativum recurrens.



# Medicine.

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## A CASE OF HYPERSECRETION OF HYDROCHLORIC ACID.

CLINICAL LECTURE DELIVERED AT THE SAN FRANCISCO CITY AND COUNTY HOSPITAL

BY JOSEPH O. HIRSCHFELDER, M.D.,  
Professor of Clinical Medicine, Cooper Medical College.

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THIS man is a native of Ireland, aged sixty-three, married, a laborer. He was admitted to the hospital two weeks ago. His mother and father were each over eighty years of age when they died, of causes unknown to him. One sister died of dropsy; another of unknown disease. He also lost one brother of some kind of fever, possibly typhus. He had whooping-cough and measles when a child. In 1856 he had rheumatism, and has been troubled with it more or less ever since; otherwise his health has been very good up to the time of the present illness. He has used tobacco to excess, and up to one year ago drank on an average three or four glasses of beer a day. For the past year he has used not more than a glass a week. He had gonorrhœa once; also a chancre about thirty years ago, followed by secondary manifestations in the skin and mucous membranes.

About one year ago, after coming from his work, he had pain in the epigastrium, headache, and nausea before he had eaten his supper. These symptoms lasted three or four days, and he has been troubled at times in this way ever since until about ten days ago. At that time, when coming from his work, he was seized with a biting pain in the epigastrium, accompanied with nausea and vomiting. These symptoms have persisted. Only once has he noticed any blood in the vomited matter, and then it consisted of two small spots. The pain of which he complains begins at about five o'clock in the evening, and lasts from one to several hours. Lately, however, it has been more continuous. He says he has not noticed whether eating has any effect upon it or not. Up to two weeks ago the patient's bowels were regular; since that time they have been severely constipated.

3

He has had headache, especially in the occipital region, and has been dizzy more or less for the past three years ; generally being worse in the morning. He has also had a buzzing noise in the ears for five or six years, and has suffered from night-sweats during the past four or five years.

The history we have just read directs attention to the stomach. The patient complains of burning pain in the stomach and of nausea and vomiting. He states that this vomited matter has a sour, bitter, and disagreeable taste. The diseases of the stomach have, within the last few years, received a great deal of attention, and the methods of investigating its functions and of studying its derangements have been very much improved. We are no longer so much in the dark concerning them as we were some years ago. At that time it was considered sufficient when the diagnosis of dyspepsia was made. When you had decided that the patient did not digest his food very well, you had done all that you could. Now this is simply the first step towards a diagnosis. The chemical method of investigating the stomach has been to diseases of that organ what the ophthalmoscope is to diseases of the eye. Unfortunately, the progress that has been made in gastrology is not so great as in ophthalmology. However, we know a great deal more about diseases of the stomach than we knew before these new methods were introduced.

In order that digestion should take place properly, it is necessary, in the first place, that the food should be presented to that organ in the proper form. The preparation of the food in the kitchen should be that which we are in the habit of considering the correct one. Secondly, the comminution of the food in the mouth, and the admixture of the juices of the mouth, especially the saliva, with the food, should be properly performed. In order that the stomach may do its duty properly after the food reaches it, and that it may rid itself in the proper manner, it is necessary, first, that the suitable kind of gastric juice be secreted ; secondly, that the food and the gastric juice be correctly intermingled (that the food be properly churned up by the stomach) ; and, thirdly, that the products of digestion of the food be removed by the stomach through absorption and by its downward passage through the pylorus into the intestines.

Disturbances of the function of the stomach may occur in any one of these directions. We may have improper digestion of the food because the right kind of gastric juice is not secreted. We may have improper digestion because, although the gastric juice is properly secreted, although the food presented is of the right character, and is



properly comminuted in the mouth, yet, on account of the lack of motion, the lack of muscular power of the stomach, the intermingling of the food with the gastric juice is not properly performed, and the requisite onward movement of the contents of the stomach through the pylorus is not obtained. Or, the absorption of the products of digestion may not be sufficiently well performed by the walls of the stomach, and these products of digestion remain in the stomach, dilute the gastric juice, and so prevent it from coming in contact with the food in sufficient concentration to digest it properly. Or, though the secreted gastric juice be of the proper character, and the movements of the stomach be properly performed, and absorption take place in the normal manner, we may yet have the symptoms that are ordinarily present when these duties are not correctly carried on. In other words, while the digestive functions of the stomach may be properly performed, yet the patient may experience all the symptoms that are ordinarily present when this is not the case. As we may have neuroses of other organs, so we have neuroses of the stomach.

We may then divide the dyspepsias into two grand classes,—the one class in which there is really dyspepsia, bad digestion, in which the stomach fails to do its duty as a digestive organ,—the second class, in which the functions of the stomach are properly performed, and yet we have unpleasant symptoms, discomforts on the part of the patient.

The method of determining whether the stomach is doing its duty is a very simple one. Through the use of the stomach-tube it has become a very easy matter to determine how the stomach performs its duty. As you see, this is a soft rubber tube with two openings, one at the end and one at the side. This is introduced into the stomach with ease, and makes very little disturbance, and, according to my experience, never causes any injury. Now, if a patient take an ordinary meal, and you introduce such a tube seven hours after and wash out the stomach, you should find no undigested contents. The stomach should in seven hours have emptied itself of the food introduced into it. If this be not the case, then, for some reason or other, the stomach has failed to do its duty. After you have determined that food is still present, the next question that presents itself is as to the reason for this. It then becomes your duty to study the action of the stomach in the various directions of which we have spoken. You have to investigate with regard to secretion, with regard to motion, and with regard to absorption. The method of determining the secretion of the stomach is very simple. You know that the active ingredients of the gastric juice are twofold. First, the specific digester,—

namely, the pepsin ; and, secondly, the acid. There was for a long time a discussion as to whether the acid of the stomach was lactic acid or hydrochloric acid. This question has now been finally decided. We know that the acid which is normally the one that is most potent in digestion is the hydrochloric acid. It has been found that immediately after eating there is lactic acid present in the gastric juice ; that the quantity of this acid gradually diminishes, while coincidentally hydrochloric acid begins to be found, and increases in amount proportionately with the diminution of the lactic acid, so that about three to four hours after eating, the amount of hydrochloric acid reaches its maximum. In regard to the pepsin, there is rarely much diminution. There are cases of complete atrophy of the mucous membranes of the stomach in which there is an entire absence of pepsin, but this is very rarely the case. It is different with the acid. The hydrochloric acid is subject to great variations under pathological conditions. Under normal circumstances the quantity varies somewhat between the range of .15 and .25 per cent., but under pathological circumstances this quantity may be completely altered. We may find either an entire absence of hydrochloric acid, or we may find as much as three times the normal quantity. Now, the process of obtaining this gastric juice is a very simple one, and I shall show you the method, and we can together investigate the gastric juice of our patient. You introduce the tube into the mouth, tell the patient to swallow, and as he swallows push the tube forward, and you find that it enters into the œsophagus without any trouble. You now push it forward until it passes finally into the stomach. Now, in order to obtain the gastric contents in the proper condition for examination by chemical test, you must have them undiluted. This can be obtained very readily by the method of Professor Ewald, called the method by expression. The contents of the stomach are forced out by the pressure of the abdominal muscles. We tell the patient to cough. You see, without any trouble to the patient, we have withdrawn the contents of his stomach four hours after he has eaten the food. Now the contents of his stomach are filtered, and after that they are ready for examination.

The first question that you wish to determine is whether this secretion of gastric juice is acid or alkaline, and by means of any of the usual tests this can be readily determined. You see from its reaction that the contents of the stomach are strongly acid. The next question is to determine what kind of an acid ; whether we have hydrochloric acid present or not, and there are a number of tests that have been devised to determine this. I will simply show you some of them ;



it is not necessary to use all. There are three that are probably as good as any. One is the methyl-violet test, which I shall show you here. Into a watery solution of methyl violet some of the filtered contents of the stomach is poured, and if there be hydrochloric acid present the violet turns blue, as you see here. Another test is the Congo paper. Congo red is an aniline color of a reddish tinge, which, when acted upon by a diluted solution of hydrochloric acid, turns blue. I dip it into the fluid drawn from the stomach, and you see the dark-blue color of the paper that has resulted, and you can see from the intensity of the color that the quantity of hydrochloric acid present is very great indeed. In cases in which the quantity is very small, these tests that I have just shown you are not sufficiently delicate to reveal the presence of the free hydrochloric acid, and under such circumstances it may be important to have a test which will answer the question, Is hydrochloric acid present or not? for a very important question may be answered by the presence or absence of the hydrochloric acid. The test which has been found to be the most delicate and, at the same time, the most positive of all the reagents for free hydrochloric acid, is that of Günzberg. This depends upon the red color which develops when the solution containing hydrochloric acid is heated with the following solution :

Phloroglucine, 2 grammes ;  
Vanilline, 1 gramme ;  
Alcohol, 30 grammes.

I have here such a solution, which I shall place upon the slide, mix with a drop of the filtered contents of the stomach, and heat with the alcohol lamp. You see the intensely deep-red color that has resulted from the test ; so that, in the fluid that we have withdrawn from this stomach there is free hydrochloric acid present in large quantities. Another test, which is very good, is one that not only teaches you when free hydrochloric acid is present, but is likewise of service to detect lactic acid, and that is the test of Uffelmann. This amethyst-colored fluid consists of a two-and-a-half per cent. solution of carbolic acid, to which a little tincture of iron has been added. When some of the filtered contents of the stomach are added to such a solution, if the acid present be free from hydrochloric acid, the fluid becomes perfectly white. If the acid that is present be lactic acid, the fluid becomes canary-colored. In our case, as you see, the amethyst-colored fluid has become white, showing that the acid was not lactic, but hydrochloric. It might sometimes be necessary to know whether, in addition to hydrochloric acid, lactic acid were present ; that test

can be readily made. Lactic acid is soluble in ether. Consequently, if you shake up the filtered contents of the stomach with ether, the ether will dissolve whatever lactic acid may be present. This ether can then be evaporated and the residue dissolved in water, and tested. It is well to evaporate the ether in a water-bath, not over the free flame, because otherwise it is liable to ignite. Besides lactic acid the ether dissolves fats. If fatty acids be present, they will show themselves. You see the residue is not acid, so that there is no lactic acid in this solution, and the acidity must be due to the hydrochloric.

Now, it is necessary to know not only that hydrochloric acid is present, but also how much. Having determined that the acidity is principally due to the hydrochloric acid, the next thing to be done is to determine by chemical analysis how much acid is present. This is done by the simple process of titration, by which is determined how much alkali is necessary to neutralize the quantity of acid contained in the fluid. I have in this burette a solution of caustic soda which is called a one-tenth normal solution. A normal solution of any substance is a solution in which one thousand cubic centimetres contains as many grammes as represents the atomic weight of the substance. In the case of this fluid, instead of there being as many grammes in it as represents the atomic weight of the substance, there is one-tenth that quantity, that is called a one-tenth normal solution. Now, from your knowledge of chemistry, you know that one molecule of caustic soda is required to neutralize one molecule of hydrochloric acid; consequently, if you use such a one-tenth normal solution, and you find that so many cubic centimetres of it are required to neutralize the acidity of ten cubic centimetres of the filtered contents of the stomach, you know that in these ten cubic centimetres there are as many molecules of hydrochloric acid as would be necessary to neutralize that quantity of alkali used, and the calculation then can be readily made.

Now, I shall make this test for you. With a pipette I draw up ten cubic centimetres of the filtered gastric contents, and into this I pour two drops of the solution of phenol-phthalein. This substance has the property of turning red with alkalies, and remaining white with acids. From the burette I add the one-tenth normal solution until the liquid begins to become red. On commencing, the burette stood at 36.8 cubic centimetres, and I shall allow the solution of alkali to flow into the filtered contents of the stomach until the red color, which you see developing and then disappearing upon shaking the mixture, becomes permanent, as is now the case. I shall then know that there is a slight excess of alkali present. I note again the position of the



burette, which is 45.4, and find that I have required 8.6 cubic centimetres of one-tenth normal solution of soda to neutralize the acid that was present here. The normal solution of hydrochloric acid is 36.46 grammes in one thousand cubic centimetres. One thousand cubic centimetres of a one-tenth normal solution therefore contains 3.646 grammes of hydrochloric acid. Then one cubic centimetre of a one-tenth normal solution contains 0.003646 hydrochloric acid. We have found that ten cubic centimetres of the contents of the stomach were neutralized by 8.6 cubic centimetres of the one-tenth normal solution. Hence the quantity of hydrochloric acid that is contained in ten cubic centimetres of that fluid is 0.003646 multiplied by 8.6, or 0.0313556, and in one hundred cubic centimetres there must be contained 0.314 (disregarding the rest) of hydrochloric acid; that means that there is present three-tenths per cent. of free hydrochloric acid. This is largely in excess of the normal. A couple of days ago, some of the contents of the stomach was taken in the same way as has been done to-day, and we found that ten cubic centimetres of the one-tenth normal solution of alkali were necessary to neutralize the acid present. In other words, we found at that time 3.6 hydrochloric acid instead of 3.1 per thousand. We have found, then, that there is a hypersecretion of hydrochloric acid.

The next question to be solved is, Does absorption go on normally in the stomach, or does it not? The test for the absorption in the stomach is a very simple one. You know that iodide of potassium when taken into the stomach is quickly absorbed, and may be readily found in the saliva. Often within ten or fifteen minutes after the iodide has been taken it can be found in the saliva. Now, if in a case in which we make the test the iodide is not found in the saliva until, say, three-quarters of an hour after it was taken into the stomach, we know that there is something wrong. We know that absorption has not gone on properly. The method to be pursued is the following: You give your patient some iodide of potassium in a capsule that has been carefully dusted, so that none of the iodide sticks to the outside of the capsule and so becomes mixed with the saliva; then you have the patient moisten little slips of starch paper, such as I have here, with the saliva every five minutes, and test each one of these papers (that are numbered so that you may know them apart) with nitric acid. If the saliva contain the iodide of potassium, a blue discoloration of the starch paper, such as I shall show you here, is produced. In order to be sure that your experiment has been properly performed, it is well to let the patient test the contents of his mouth, immediately after

swallowing the capsule, with starch paper in the same way. I have had this done in this case, and we found that twenty minutes after taking the iodide it began to appear in the saliva, showing that absorption occurs in his stomach in the normal manner.

Does the stomach empty itself in the normal manner, or not? Various methods have been devised to determine this point. One method is to introduce a measured quantity of oil into the stomach, and then, after a given time, recover the oil with the stomach-tube and compare the quantity that was introduced with the quantity that is found. A better and a simpler means is by the salol test. Salol is a combination of salicylic and carbolic acids which is not acted on by acids, but is readily split up by alkalies into its component parts. So long as this salol remains in the stomach, it is insoluble and is not absorbed. So soon as it passes into the intestines, however, it is split up by the action of the alkali present into its component parts. These are absorbed and pass out in the urine, and the salicylic acid can be found there by the ordinary test with the tincture of iron. I shall show you the test of which I have just spoken. You give your patient a dose of salol, say fifteen grains. So long as it remains in the stomach no absorption takes place. The moment that it passes out of the stomach into the intestines, the reaction that we have spoken of—of the alkali upon the salol—occurs, the salicylic acid is absorbed and begins to appear in the urine. All you have to do is to examine the urine that has been passed and determine by the salicylic-acid reaction at what time the salol has become absorbed. We have done this in the case of our patient, and found that the salol was absorbed, and the salicylic acid appeared in the urine an hour and a half after the salol had been taken. We had the patient pass his urine every half-hour in separate bottles, which you see here. To a sample of the urine in each of these bottles we add tincture of iron, and you see a wine-color develop in that passed after one and one-half hours. This is the time at which the reaction begins to appear in normal cases. In order to be perfectly accurate in making this test you should add some hydrochloric acid to the urine, dissolve with ether, evaporate the ether, dissolve in a little water, and then test.

We know, from the test just made, that in this case the motility of the stomach is likewise normal, or very nearly so. Now, it is well to know whether the size of the stomach be normal; whether there be an enlargement of the stomach present or not. For this purpose a very simple test suffices. You can use the stomach-tube that was shown to you at the last clinic, and through it force in air with an



ordinary Davidson syringe or a special apparatus. This method of blowing air into the stomach has great advantages over the method that was formerly used, of first introducing bicarbonate of soda into the stomach, and then following this up with an acid mixture, such as one of tartaric acid. The result of that method was that you could not measure the quantity of gas developed. The distention of the stomach was entirely beyond your control. With this method of blowing air through the tube into the stomach, you have the matter entirely in your hands. I have introduced the stomach-tube, and with the syringe I force air into the stomach. You hear how easy it is to percuss the border of the stomach. I have done so, and have marked off the edges of the viscus, and you see that there is no abnormal distention. The air can now be readily forced out again through the same tube that it entered, and there is no discomfort to the patient from the examination. We have learned with regard to our patient that he has a stomach that is normal in size; a stomach that absorbs its contents normally, and empties its contents into the intestines in the normal manner; a stomach, however, that secretes a larger quantity of acid than is normally the case; and we have furthermore found that on one day upon which the secretion of hydrochloric acid was nearly normal, the patient had no discomforts; but, on other occasions when he has had discomforts, we have found that there has been a hypersecretion of that acid. In order to determine whether this hypersecretion of hydrochloric acid was continuous, or whether it occurred only when food was introduced, we washed out his stomach, one evening, gave him no food until after we had introduced the stomach-tube on the following morning, withdrew the contents of the stomach upon the following morning, and found no hydrochloric acid present; showing that, when no food is introduced into the stomach, there is no secretion of hydrochloric acid going on, but that when food is introduced there is an exaggeration of the normal activity of the glands of the stomach, and a hypersecretion of hydrochloric acid. Now, it is a fact that the increase of the amount of hydrochloric acid in the gastric juice does produce the symptoms of dyspepsia. In the first place, the increase in the acid irritates the stomach and causes a certain amount of pain and burning. Secondly, the presence of a large quantity of hydrochloric acid interferes very materially with the digestion of the starchy foods, and, if the acid be present in a very large degree, interferes even with the digestion of the albuminous matters. Those who have investigated the subject most and have devoted most attention to gastric diseases have con-

cluded that, wherever we have inflammation of the mucous membrane of the stomach, there is produced a certain amount of degeneration of the glands, and that this degeneration causes a diminished secretion of hydrochloric acid; that, wherever we have an increase in the quantity of hydrochloric acid in the gastric juice, we have to do with a neurosis of the stomach; and that this hyperacidity due to the increased secretion of hydrochloric acid is of very frequent occurrence, and the neurosis which produces it is one that is very often met with in practice. Theoretically, it would be a simple matter to neutralize the acids of the stomach and expect the patient to get well. Unfortunately, it does not work in that way practically. The use of alkalies in the treatment of this hypersecretion is not attended with the beneficial results that one might expect. There may be, and there is temporarily, benefit from the use of alkalies. If you administer alkalies to a patient suffering from the effects of hypersecretion of hydrochloric acid, there is a diminution in pain and other discomforts, but the next time food is introduced the same trouble occurs, the same hypersecretion again takes place.

The best local treatment is lavage of the stomach. Let the stomach be washed daily with warm water. The soothing effect of the warm water upon the glands of the stomach, the beneficial effect of the removal of irritants from the walls of the organ, show themselves in the improvement in the condition of the patient; and not unfrequently you will cure such a neurosis of the stomach simply by washing out that viscus. In other cases this method will fail to produce a cure; and in order to accomplish that result you must act upon the central nervous system. In a large number of cases the patient is hysterical, or neurasthenic, or is affected with some other functional nerve derangement, and it must be your duty then to attack the causal disease. It may be with moral treatment, it may be with a rest cure, it may be with drugs. The various methods that would be resorted to in the treatment of these functional disorders of the nervous system would have to be employed in the given case. I need not enter into the treatment of these diseases this morning. One remedy which I can ordinarily highly recommend to you in the treatment of this condition is chloral hydrate, which, given in doses of from five to ten grains, well diluted in water, after meals, is very apt to diminish the quantity of hydrochloric acid present. We shall have the stomach of our patient washed out with warm water at night before he retires, and, in addition, give him ten grains of chloral three times a day well diluted with water, so that it may not irritate the stomach.



# ACUTE INTESTINAL OBSTRUCTION, ESPECIALLY IN CONNECTION WITH THE POSSIBILITIES OF SPONTANEOUS RECOVERY AFTER THE OCCURRENCE OF STERCORACEOUS VOMITING.

THE SUBSTANCE OF A CLINICAL LECTURE DELIVERED AT THE WESTERN INFIRMARY, GLASGOW.

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IN a recent paper on the above subject, read by my friend, Dr. B. W. Richardson, to the Medical Society of London, February 18, 1889, and published in his admirable journal, *The Asclepiad*, of the same year (vol. vi. p. 101), the proposition is advanced that the occurrence of stercoraceous vomiting in such cases forms the ground for "a common understanding and a common line of action" in all such cases, independently altogether of the *diagnosis of cause*. It is suggested that whenever stercoraceous vomiting has occurred, it may be properly assumed that "now is the time to operate by opening the abdominal cavity and endeavoring directly to detect and relieve the obstruction;" or, as he afterwards puts it, on the basis of personal experience, "gradually I have been led to the conclusion that, every detail being considered, the first sign of stercoraceous vomiting indicates the moment when the best chance for the patient, in the sum total of instances, lies in immediate operation."

I am very far from wishing now to suggest that the symptom in question is not one of the very highest importance; nor am I even prepared to affirm that the "proposed rule of practice" here submitted, carefully guarded as it seems to be, will not in many or the majority of instances lead to a right practical conclusion. This is a question especially for surgeons, and I am not concerned in discussing it here at large, nor am I, indeed, competent to do so. The physician's view

of such cases, in so far as it reasonably differs from the surgeon's, may be supposed to differ chiefly in the estimate formed of the chances of recovery spontaneously, or by treatment short of operation. In this estimate my opinion, as founded on experience, differs in at least one important particular from Dr. Richardson's, as will be seen presently.

The whole of this vast subject of intestinal obstruction has been lately considered in great detail. 1. In the Transactions of the Congress of American Physicians and Surgeons, held at Washington in 1888.<sup>1</sup> 2. In the discussion at Birmingham in the Surgical Section of the British Medical Association last year (1890), as well as in the exhaustive little volume of Frederick Treves, F.R.C.S.,<sup>2</sup> and several articles in the various surgical and medical dictionaries. I have not observed, however, that the precise question raised by Dr. Richardson has been, in any of these descriptions, placed in exactly the point of view which it is the object of this note to set forth, without prejudice to the ultimate decisions arising out of the facts of any particular case. I may add that the vague and ill-defined responsibility arising out of such cases has cost me more anxious moments than any that I can remember as arising within the bounds of a physician's responsibility at any time; and that nothing would be more acceptable than a simple rule of procedure, such as that proposed, for general guidance.

But, as regards this particular rule, there are certainly two remarks to be made before accepting it finally: 1. That it is at least possible for recoveries to take place spontaneously after stercoraceous vomiting has occurred and has continued for some time. 2. That stercoraceous vomiting may not occur at all, or may occur only when it is too late for an operation to be done with any chance of saving the patient. Of these two propositions the former is the more important to be considered; for, if it were true that stercoraceous vomiting indicates in every case the extreme limit of possible recovery short of operation, it might be a manifest duty to operate, in doubtful cases, on the principle of merely giving a chance, however small. This is evidently Dr. Richardson's opinion, for he not only contends that this symptom is "always accumulative in its bad effects so long as its cause remains in force," but he affirms further: "I fail to find in the list of examples that have come under my own notice during a long career, *one single instance* in which recovery has taken place after the appearance of stercoraceous vomiting in the acute form, *except in one instance where oper-*

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<sup>1</sup> Papers by Dr. R. H. Fitz, Dr. N. Senn, and others.

<sup>2</sup> Cassell & Co., 1884.



ation was carried out. This experience is, I believe, not in any degree exceptional" (p. 108).

Now, it is here precisely that my experience differs from Dr. Richardson's; and whatever be the amount of importance that may ultimately attach to the point in question, it seems necessary that the facts should not be lost sight of on either side, either in advocating early operation or the reverse. In a recent clinical lecture I had occasion to bring forward a fatal case of internal strangulation, or intussusception, in which, unfortunately, no operation could be proposed, owing to the rapid sinking of the patient within a very few hours after admission; but in which, had the patient lived longer, or been less collapsed, both of the questions above referred to might have been very sharply brought up. It is perhaps unnecessary to give many details of this case, because these questions were not, in fact, fully entertained during life; but, nevertheless, the post-mortem examination showed that an operation could not possibly have been followed by any good result at all,—the invaginated bowel being already gangrenous. On the other hand, the case, as regards the merely mechanical conditions apparent, was a favorable one for immediate interference according to Dr. Richardson's rule. Obstruction had existed for four days only, and was not, perhaps, quite complete, as the appearance of a little liquid fæces with blood still followed the injections. There was almost no peritonitis (even according to post-mortem results); and the repeated and severe vomitings following abdominal pain had led gradually up to vomiting of the stercoraceous type at least twelve hours before death. In addition to which facts (but this, on the other hand, was perhaps an argument for delay) it was ascertained that a similar attack, less severe, had occurred about a year before, and been followed by an apparently complete recovery.

In the course of my personal experience cases of spontaneous recovery after stercoraceous vomiting have occurred at rare intervals, and several other cases have been communicated to me by others, but not always with details such as to carry entire conviction. The following case, however, was recorded at length in the *Lancet* for May 25, 1861, p. 504; and, besides the fact of its being the subject, in part, of three clinical lectures at the time, and therefore more vividly presented as a narrative than would otherwise have been possible, it seems to involve no reasonable doubt as to the essential facts. The case is here presented in abstract only, but the entire narrative demands to be consulted if available.

CASE I.—*Clinical Lecture, Friday, November 16, 1860.*—"Susan

Mc——, aged ten, admitted six days after attack of severe abdominal pain, with intense headache. Previous health good. Every day except one she had vomiting of bilious matter, thirst, and constipated bowels; purgative medicine was vomited almost immediately. No proper alvine evacuation. Not much fever. Complexion clear and natural. No evidence of peritonitis. No evidence of local tumor or of hernia. Some dulness on percussion in left flank. Obstruction regarded on this account as *probably* in the colon. Small intestines evidently greatly distended and *mapped out distinctly on the surface of the abdomen by visible peristaltic movements*. Question of fæcal impaction entertained, and the long tube diligently employed accordingly. The objection to an operation, or rather the difficulty of deciding upon it, in a case like this arises from the great uncertainty of the diagnosis. We know that there is an obstruction, but we have no exact knowledge where it is, or what it is. We have, therefore, a natural, almost an insuperable, indisposition to lay open the abdomen on speculation."

At a later stage this opinion was adopted by Mr. Spence, one of the boldest surgeons at that time in Scotland, who was called in consultation, and who declined to operate.

*Clinical Lecture, Friday, November 23.*—"Thirteen days ill; no relief. The injections brought away a few very small masses, but not an ounce of real unquestionable fæces. Vomiting continues, and looks worse and worse; for the last two or three days it has been very frequent, and in color and odor absolutely stercoraceous; there is also hiccup to a considerable extent. Nothing can be worse than this combination of symptoms. . . . Would there be any chance of doing good by an operation? and, if so, what ought to be done?"

Question of operation here discussed in full detail, together with Mr. Spence's opinion, which, as above stated, was unfavorable to opening the abdomen.

*Friday, November 30.*—"I am very happy to tell you that our case of obstructed bowels is now safe. Our expectant policy is fully justified. . . . At last lecture I told you we had purely fæcal vomiting of some days' standing, hiccup, considerable prostration, something, in fact, like an approach to choleraic collapse; the expression of countenance was getting to be very Hippocratic, but there was little or no fever. . . . She passed nothing spontaneously up to the 24th (the day after lecture and the fourteenth day after disease). At last there began to be a slight oozing of liquid matter, very fetid, and *so exactly similar to what had been vomited just before, that I absolutely could not tell the one from the other*. After this the stools became more copious,



and now for some days she has had more than enough of it. There has been quite a copious diarrhoea, which in her exhausted condition has been very trying to her, and accordingly many stools have been passed in bed. . . . There was never a drop of blood in the dejections, nor the smallest trace of a slough. She is now well on the road to a complete recovery."

Even in the somewhat bare abstract here presented in which all the argumentative parts of the lectures given have been suppressed, it will be observed that the *possibility*, in such cases, of a spontaneous cure was distinctly before the mind, and was held up as a ground for delay or for abandoning the operation. No doubt abdominal surgery has made immense strides since 1861, and there will be many who will object to one small argumentative clause in the above narrative. "Our expectant policy is fully justified." I am not concerned to defend it from the present-day point of view, but I apprehend it is impossible that cases like this can or ought to be altogether discounted in an estimate of prognosis, and, therefore, in view of Dr. Richardson's proposed rule of practice aforesaid, it is only right that cases of this kind should be, even so long after date, brought to the front and fairly reconsidered. Another case of the like kind, in an adult, is referred to briefly in this very paper, the *Lancet*, and I proceed now to notice one or two others of more recent date, in which, however, from the absence of full notes taken at the time, I am not in a position to give more than the essential and most salient facts.

CASE II.—In a case seen by me with Dr. Robertson, of Ardrossan, some years ago, the facts of this young girl's case were almost exactly reproduced in a man under twenty years of age, who had on two or three previous occasions suffered more or less definitely from symptoms of obstruction. In this case, after waiting for more than a fortnight (I think about three weeks from the first occurrence of symptoms), no faecal matter at all had been passed downward, notwithstanding many large injections, but, the vomiting and pain having been considerably allayed by the free use of opium and of belladonna, it was determined to bring the patient up to Glasgow for the benefit of surgical assistance. He was accordingly placed in an invalid carriage and carefully tended by Dr. Robertson in a journey of thirty-five miles, after which he was seen by Sir George Macleod. The vomiting was at this time less urgent, and there were no symptoms of peritonitis, so that it was determined to wait for a time to be ruled by circumstances before proceeding to an operation. During this period of delay, the bowels began to act spontaneously, and a complete recovery was the result.

Dr. Robertson writes to me as regards this case: "I think the lad (aged nineteen) was ill about a week before I saw him, Saturday, 30th June, 1883. I was in regular attendance upon him from that date up to Monday, the 9th July, when I accompanied him to Glasgow. Immediately on arrival he was examined by Sir George Macleod, who determined to perform laparotomy, but thought it advisable to delay operating for a day or two to give the patient time to recover from the fatigues of the journey. When I returned to Ardrossan next morning, I found a telegram with the gratifying intelligence that Wm. S. had passed a large natural motion at six o'clock in the morning. Did the rough journey force the passage?"

I have only to add that in this case, as in the former, the vomiting had been distinctly stercoraceous for many days, and also that the definition of the enlarged small intestines on the abdominal wall by their constantly visible peristalsis was a striking feature of the case.

CASE III.—The following case has been communicated to me by Dr. H. C. Cameron, surgeon to the Western Infirmary, Glasgow, who was called in to operate, and who remarks that, although the official notes of the case are not very complete in details, the main facts are as stated in the hospital journal. "The child," he adds, "was in a state of collapse, with a very tightly-distended belly, when we arrived to operate. She had been vomiting shortly before. I felt perfectly certain at the time that the child's life had been saved by the accident of not having been operated on." The following is the official record of the case:

Mary M., aged five and a half years, admitted to the Sick Children's Hospital, Glasgow, August 13, 1888, with intestinal obstruction. About a week before admission the child complained of pain in the lower part of the abdomen, having previously been in perfect health. She was seized suddenly during the afternoon, vomited, and had a very distinct rigor. She has had no movement of the bowels since, and after an interval the pain and vomiting returned. She now retains nothing whatever.

*August 14.*—Vomiting distinctly stercoraceous. Temperature nearly normal. No tumor could be felt, but abdomen becoming more and more distended (belladonna). As her case seemed very hopeless, it was agreed, after consultation, that abdominal section should be performed in the evening by Dr. Cameron. On his arrival to operate the child seemed markedly worse. All preparations having been made, the nurses went to carry the child to the theatre, and one of them returned to report that the bowels had been moved during the struggling



which took place while a nurse was trying to pass a catheter. Dr. Gammell, who had charge of the case, went to see to this, and reported that, although small in quantity, the discharge was decidedly faecal. It was accordingly agreed not to proceed with the operation.

*August 15.*—Six copious motions during the night, and two or three to-day, with corresponding improvement; but child very weak.

*August 24.*—Since last report the bowels have been moved daily by castor oil or enemata. Motion on the 21st was hard and lumpy. For the last two or three days the abdomen has been getting less painful to touch, and she now allows it to be freely handled all over.

Convalescence uninterrupted. Dismissed, quite well, on October 2, 1888, after seven weeks' residence.

CASE IV.—Dr. Robert Kirk, of Partick, has recorded in the *Lancet* of June 8, 1889, the case of a man twenty-two years of age, first seen by him on the fourth day of an acute intestinal obstruction, which did not yield to any of the remedies employed. On the seventh day "he vomited a large quantity of stercoraceous matter, and this was several times repeated on the two following days, during which morphia was freely administered." In this case, as in the one above related, Dr. Cameron was called in consultation, "when the question of opening the abdomen was considered, and its decision postponed till the following day." Dr. Kirk attaches great importance to the passing of the long rectal tube in this case and the injection on several occasions of one hundred and twenty ounces of liquid. The details of this case are fully given, and it will be sufficient here to say that a persevering use of the tube gradually (though not without a return of pain and distention on one occasion) completely removed the obstruction.

It is not the object of these remarks to prejudice the many and difficult questions which arise in connection with operative interference in acute intestinal obstruction by any statement of doctrine on the subject. My sympathies are entirely with the triumphs of modern abdominal surgery, and I should be very sorry to say a single word against them. It may be that, after all, it is *safer* in the long run, in many of these cases, to operate early than not to operate. It may be that, after all, Dr. Richardson is right in saying that "*every detail being considered, the first sign of stercoraceous vomiting indicates the moment when the best chance for the patient, in the sum-total of instances, lies in immediate operation.*" Only, it can scarcely be denied that facts like these above given ought to weigh for something, more or less, in the sum-total of instances.

## AORTIC INSUFFICIENCY.

CLINICAL LECTURE DELIVERED AT UNIVERSITY HOSPITAL.

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University of Maryland.

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THERE is very often a failure to appreciate in a proper degree the importance of diagnosing exactly the nature of the various valvular diseases of the heart. There is a rather wide-spread idea that when one has determined that a patient has valvular disease of the heart, there is very little to do; that it is a condition of things beyond the reach of remedies. Now, let me disabuse you of any such impression. It is entirely erroneous, for, while it is true that valvular disease of the heart is very intractable and often absolutely resists the influence of treatment so far as we can see,—at least showing no immediate results,—we can usually effect a great deal by our management of such cases, and, if we would manage them properly, we must have definite knowledge of the nature of the lesions.

To-day we shall interest ourselves in a special lesion of the valves and its most important consequences. I refer to aortic regurgitation or insufficiency.

Here is a case. He is a young man, aged thirty years, a huckster, naturally strong and fairly healthy. He does not remember to have had rheumatism or scarlet fever. He did, however, have dropsy when ten years old. That this dropsy was cardiac is quite uncertain; he seems to have recovered from it entirely. At the same time you must remember that children have wonderful recuperative powers, and that when they have very extensive valvular disease of the heart,—as they often do,—they seem to have a faculty of compensation which is perfectly wonderful, and we see lesions which we think are desperate, over which the child gets a certain compensative control and remains able to be up and about for many years. Whether this attack was one following scarlatina, or one in which the valvular trouble was the re-



sult of rheumatism or other disorder, I cannot say, but I am inclined to attribute the present trouble to it, although it occurred twenty years ago. The patient has been attending to his business. He is a man who has been accustomed to drinking moderately, but not excessively. He denies syphilis, and dates back his present trouble about two and a half years. He has a dry, hacking cough and pains about the region of the heart, which have been gradually getting worse. About six or seven months ago he was taken with shortness of breath, which has gradually increased to date. In the morning he spits up some mucus. He says he cannot sleep well at night on account of the pain.

Let us proceed at once to the study of those features of our case that have special relation to the subject that we are about to consider to-day.

Observing the naked trunk, one is at once struck by the forcible pulsations that can be observed readily at many points where in health they are not present. His apex-beat may be seen quite an inch outside the nipple line, in the fifth intercostal space. It can be felt in the sixth interspace in the same line. A heaving is perceptible over the whole præcordium; a pulse is plainly visible in his subclavicular and supra-clavicular spaces; a violent throbbing of the carotids is readily seen, and a keen sight is not needed to detect the heavy beat of the temporal and radial arteries. Such a forcible and far-reaching pulse is quite beyond our experience with the normal. Now, to go a step further, I place my finger over the radial artery and feel a very full, sharp, and sudden pulse. If you will examine the pulse of a healthy person, you will detect a stroke which does not fall away from your finger at once. You are conscious of a resistance, which I may tell you is due to the recoil of the distended artery upon the blood which is being forced by the compression in the only direction in which it can escape, towards the peripheral circulation. Here this element of the pulse is lacking. One feels, it is true, a remarkably forcible stroke, which exhausts itself, however, at the instant. It is gone at once. This pulse has been compared to the stroke of a water-hammer or to the passage of beads or shot under the finger. It is called "Corrigan's pulse," after Sir Dominic Corrigan, who described it. It is characteristic of aortic insufficiency, but may be simulated by conditions of extremely low arterial tension with strong heart-action, as is exhibited in the sphygmographic tracing<sup>1</sup> I now pass around (see Fig. 1), that of

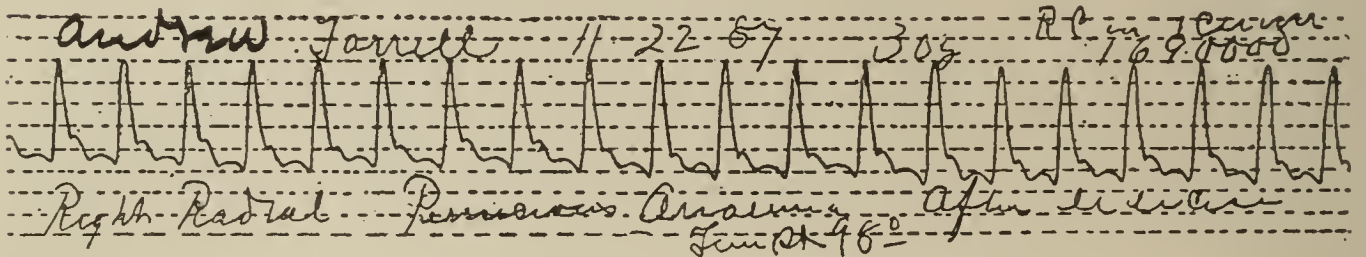
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<sup>1</sup> The sphygmographic tracings were taken with Richardson's modification of Dudgeon's sphygmograph.

the radial artery of a man suffering from progressive pernicious anæmia.

The *rationale* of this peculiar pulse I shall explain later. For the moment I only ask you to become acquainted with it. That the violent heart-action, of which you have the visible evidence, probably dates from a period long antecedent to that which our patient assigns to it, is shown by the distinct bulging of the left chest wall anteriorly.

FIG. 1.



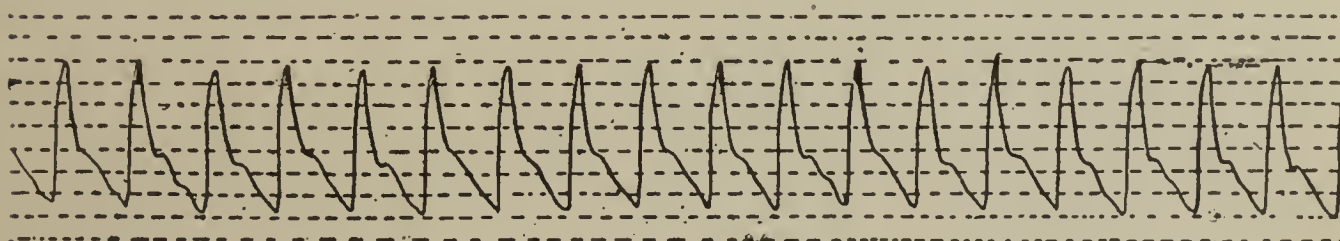
Before passing to the consideration of other physical signs and symptoms, observe that despite violent heart-action the man is pale and evidently anæmic.

Upon auscultation over the base of the heart, a loud and prolonged murmur is heard with both systole and diastole. Without entering fully into the explanation of the facts, let me mention that one will be reasonably safe in referring a purely diastolic murmur to aortic regurgitation,—insufficiency of the pulmonary valves, which otherwise exhibits a murmur quite similar, being, practically, not encountered in valvular disease acquired *extra utero*, while narrowing of the auriculo-ventricular orifices, which from analogy might be expected to produce diastolic murmur, rarely does so, unless in connection with the pre-systolic murmur characteristic of that lesion. We shall presently have an opportunity of considering this point. Let me remind you, however, that the presystolic murmur and the diastolic murmur of auriculo-ventricular stenosis are heard over an area nearly restricted to the immediate vicinity of the apex; while in our present case, the murmurs are heard with great and equal intensity all over the sternum, and are readily detected all over the upper chest area, both anteriorly and posteriorly. Immediately about the mitral and tricuspid areas they are very faint. In the absence of other perfectly characteristic signs, it would be impossible to locate the point of differential maximum intensity, as it is called, at its usual site,—the head of the third costal cartilage or second intercostal space close to the right sternal border. It should not be forgotten, however, that the murmur of aortic regurgitation is not to be heard at all at the aortic area in some rare cases, but that it is heard as a purely diastolic murmur at the apex,—cases in



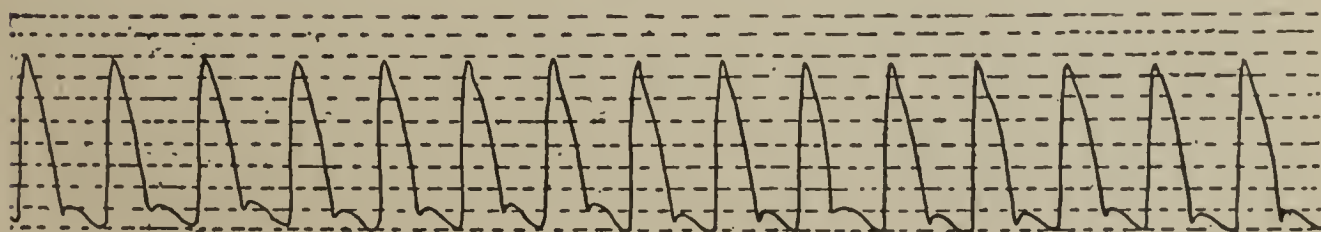
which the concomitant symptoms leave no shadow of doubt as to the actual lesion. Mr. Balthazar Foster thought to explain this curious and important phenomenon upon the theory that in these cases it is the posterior cusps of the semilunar valve that are affected. I have seen a few cases that might have admitted such an explanation. You will remember, however, that our patient has also a systolic-basic or aortic murmur. This murmur is usually accepted as indicating stenosis or narrowing of the orifice. Yet there is surely no reduction in the volume of blood which flows through his aortic orifice,—certainly there is no actual stenosis. There are, however, roughening, irregularity, and possibly distortion of the orifice, but no diminution of calibre. The violent arterial pulsation shows this; so does the sphygmographic tracing, in which there are but faint signs of the slanting upstroke characteristic of the delayed pulse of aortic stenosis, as shown in the tracing I now exhibit (Fig. 2), but more especially in the one I now

FIG. 2.



take from this second patient (Fig. 3), who presents equally with our first patient the basic systolic and diastolic murmurs of aortic stenosis

FIG. 3.



and insufficiency. He is fifty years old, a laborer, who has followed his regular occupation up to a very recent date, but who has been conscious of some cardiac disturbance for about five years, though he has never had dropsy, and has never shown any lividity of countenance. On the contrary, his face is habitually pallid, as you see it. The main symptoms are quite similar in the two patients, but in each the characteristic features of the pulse of aortic regurgitation have, as an addendum, the slanting upstroke of true stenosis faintly indicated at the summit of the excursion.

Let me recur for a moment to the distribution of the abnormal

heart-sounds. For each valve and orifice there is ascribed a definite area where the intensity of its sound or murmur is greatest, both actually and as compared with other murmurs and sounds. It occurs with very great frequency that murmurs, from their intensity and wide distribution, utterly baffle all efforts to locate them solely by consideration of these points of "maximum differential intensity." From simple auscultation it would be difficult to determine the exact location of the systolic murmur presented by this young woman, for example. She is sixteen years of age. She says that her whole train of symptoms dates back no further than last November, when she had her first attack of acute rheumatism. A loud systolic murmur may be heard all over her chest, anteriorly and posteriorly. It may even be heard over her carotid arteries. It is hardly more pronounced over the mitral than over the aortic area. The closure of the tricuspid, pulmonary, and aortic valves may be detected. I am sure that she has no aortic stenosis, because her pulse is full and strong. While her countenance is livid and semi-cyanosed, her left ventricle is distinctly hypertrophied, its apex beating one-half inch outside the nipple line, and with great vigor. She has insufficiency of the mitral valve, which I am able to diagnose from the concomitant symptoms rather than from differential intensity of the murmur.

Here is another case which presents much greater difficulties of diagnosis. This man is forty-two years of age. He is a bartender, single, and of slender physique. He had rheumatism six or seven years ago, and again four years ago, by which attack he was confined to bed. Became syphilitic ten years ago. Nearly ten years ago he had a sudden partial paralysis of the whole left side. I saw him first two years since at Bay View Asylum. He was then about such a looking man as he is now. He had no dyspnoea except after exertion. He had a smothering feeling when lying upon his left side, but could lie flat upon the bed with comfort. He had no pain, and never had had dropsy. He never had irregular palpitations, but on walking up a high flight of steps felt as if his heart was coming out of his mouth. He was very slender. His apex-beat was visible one inch outside of his mammary line. Pulsations were visible in the supraclavicular spaces. Radial and temporal pulses visible. Radial pulse sharp and fairly full when hanging, but when raised above the head, very feeble and compressible. Carotid pulsation marked. There was no epigastric pulsation. Over the apex a faint thrill could be felt, apparently presystolic. A loud, rough murmur, diastolic and presystolic, was heard within a space extending from the fifth interspace,



one and a half inches inside the mammary line, up to the third rib, and outwardly as far as the posterior axillary line. The murmur gradually faded away towards the tricuspid area, where it gave place to a sharp valvular sound. *There was no murmur over the aortic area.* The second pulmonary sound was clear, but a faint systolic murmur was heard over this area. There was also a faint systolic murmur over the common carotid arteries. The præcordium was decidedly bulged. There was no sign of impeded circulation through the lungs or systemic veins. The patient was very pallid.

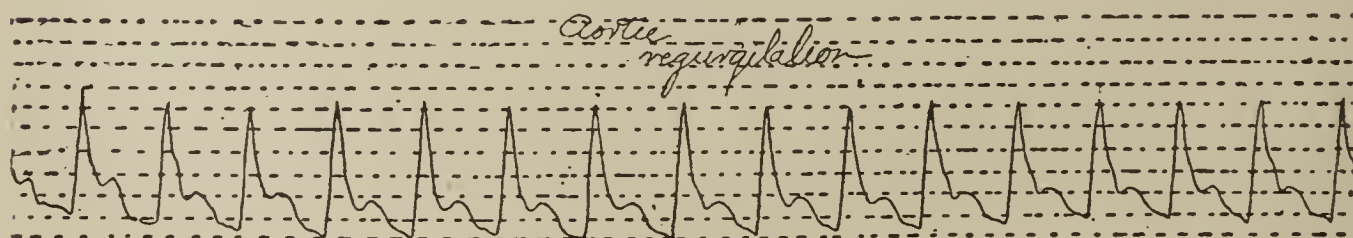
Though the presystolic character of the apex murmur and thrill could not be denied, I was constrained, in the presence of indubitable evidence of great left ventricular hypertrophy, of the bulging præcordium, of the violent pulsation of the large systemic arteries, symptoms certainly not to be looked for from the ordinary atrophied left ventricle of mitral stenosis, to claim, at least, that aortic regurgitation was present, and to incline to the opinion that the diastolic murmur at the apex was an example of Balthazar Foster's insufficiency of the posterior cusp of the aortic valve, or, more probably, an instance justifying the late Austin Flint's theory that the presystolic and diastolic apical murmur may reasonably be present in aortic insufficiency where mitral stenosis is altogether absent.

The man passed from my observation, and I find him again upon assuming service at this hospital. It is interesting to observe that while the signs indicating mitral stenosis persist with undiminished intensity, a diastolic basic murmur indicating aortic regurgitation is now plainly distinguishable. The presystolic apical thrill, the characteristic presystolic blubbery murmur, the pulse, all indicate the existence of mitral stenosis, yet all over the upper portion of the chest, anteriorly and posteriorly, even extending into the carotids, the soft, prolonged bruit of aortic insufficiency may be heard. The typical features of presystolic murmur are preserved within a circumscribed space about the mitral area,—a harsh, blubbery murmur. Our patient, then, has a combination of mitral stenosis and aortic regurgitation. With such grave lesions of the heart he undoubtedly owes the slow increase of his disabilities to the partial hemiplegia which impedes his locomotion, and protects him from undue strain.

Let us now consider some of the consequences of this insufficiency of the aortic valve, to which I have more especially called your attention. Normally, as the ventricle contracts the cusps of the aortic valve are floated out by the current of blood and offer no obstruction to its passage. The aorta and great vessels are now filled to overflowing.

Their elastic coat stretches just as over-distention stretches an elastic rubber tube. Just as the ventricular contraction is spent, the distended aorta contracts upon the volume of blood within it and forces it in the directions of least resistance. These are onward towards the ever-widening capillary circulation and backward towards the cavity whence it came. The reflux current drives together the cusps of the semilunar valve, and thus provides for itself an effective barrier to further backward flow, and the blood can now escape only through the net-work of vessels in front. If now this valve be not properly closed, a portion of this backward-flowing wave of blood escapes into the ventricle, whence it has just come, and the pressure in front is relieved just in proportion to the extent of this leak. Thus during diastole the ventricle receives blood both from the auricle behind and the aorta in front and becomes over-filled. It becomes dilated. At the same time it must discharge an increased volume of blood with each contraction. As it feels this increased strain put upon it, it becomes stronger,—a compensative enlargement occurs. Under ordinary circumstances this compensation keeps pace with the valvular defect. If the lesion be progressive, the ventricle continues to enlarge until it may acquire enormous size. Hearts in this condition have been known to weigh forty to forty-five ounces, and even more. This hypertrophy is absolutely a preservative process ; it is the provision that the heart makes to overcome its difficulties ; if it did not occur the circulation could not be carried on. After a while, when the heart reaches the limits of its

FIG. 4.

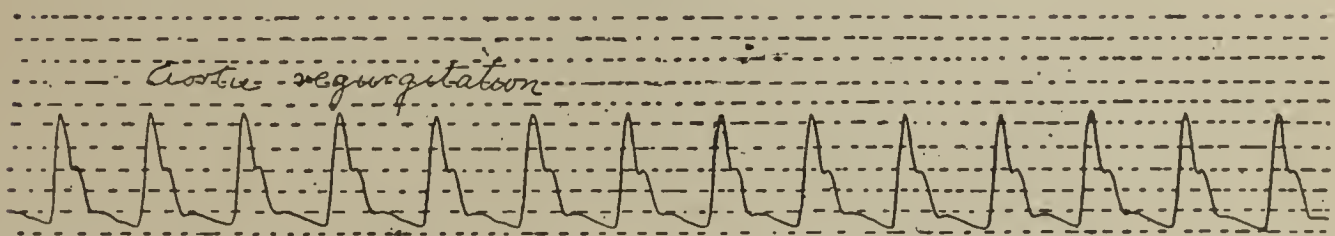


power of enlargement, it begins to tire, its muscular wall weakens and yields, and its cavities increase. Then we get signs of a weakened heart, relative insufficiency of the mitral valve develops, and the blood dams up in the lungs and systemic circulation. So long, however, as compensative hypertrophy exists these results do not occur, and the blood is sent into the arteries in a huge wave, as is shown in these tracings (Figs. 4 and 5). Although the force of the ventricular contractions is enormously increased, our patients remain in a constant state of anæmia of the smaller arteries. The value of the increased force of the heart-beat is lost in great measure through the leak in the valve.



The elasticity of the vessels, which serves normally during diastole to propel the blood into the distant circulation, is exhausted in the sudden collapse of the vessels upon the volume of blood now escaping both backward and forward. The powerful ventricle sends the blood-wave far beyond its usual limits ; often into the capillaries and even into the veins, where the pulse may be observed, as in the small veins of the back of the hand. The capillary pulse may sometimes be shown by

FIG. 5.



the alternate blushing and bleaching of the line of hyperæmic reddening caused by scratching the cutaneous surface with the point of a pencil. The sudden collapse of this magnified pulse-wave caused by the leaking valve is the origin of the short, sharp, hard, characteristic “water-hammer” or “Corrigan’s pulse.”

Our first two patients, each with enormous cardiac enlargement and with advanced valvular defect, have symptoms which are attributable to defect in front of the mitral valve,—in each this valve is as yet perfect. The left ventricle has difficulty in distributing the blood to the distant parts of the body, but the mitral valve stands sentry and keeps the blood from going back any further, passive engorgement of the pulmonary and systemic circulation cannot occur. A perfect mitral valve enables the sufferer from aortic regurgitation to perform his daily work, often after an almost incredible degree of hypertrophy and insufficiency has developed. It is usually not until dilatation of the ventricle produces relative insufficiency of the mitral valve that we have symptoms of the damming of blood in the venous circulation, with pulmonary œdema and all the dangers and distress of passive engorgement.

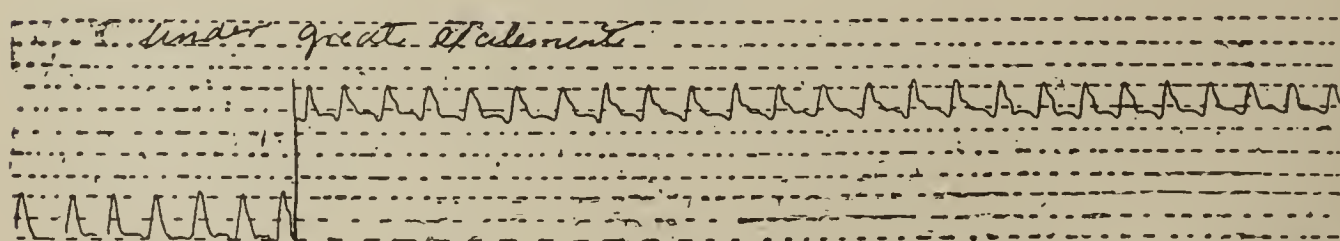
While this form of valvular disease is compatible with the performance of most of the ordinary duties of life, it is the one in which fatal syncope is most often observed. This does not depend upon the degree of enlargement or of dilatation. There may be under special conditions, in any degree of aortic insufficiency, a sudden over-distention of the ventricle, and the stretched muscle is unable to contract, and all is over in an instant. Fortunately, this result is usually postponed, often for years, and, though ultimately our prognosis must always be unfavor-

able, our patients are spared many years of active usefulness even when the degree of valvular defect is far greater than could be borne in disease of any other valve or orifice.

**Treatment.**—One should never lose sight of the fact that in valvular disease of the heart hypertrophy of the cardiac muscle is a salutary process through which the heart is able to overcome by increased energy the defects caused by crippled valves or orifices. Did the enlargement not occur the organ would soon succumb to its increasing burdens and life would cease. With enlargement it is often able, in cases of more progressive valvular disease, to maintain the circulatory equilibrium for an indefinite time and to prolong the life and preserve the comfort and usefulness of the individual. It is especially true that in the treatment of aortic insufficiency the labors of the physician should not be directed against this compensative hypertrophy. The ordinary heart tonics or stimulants are not only not useful, they are harmful. Agents and influences that quiet and reduce the force of the heart's beat are, on the other hand, very often indicated. For example, one often meets with cases of aortic regurgitation with great cardiac hypertrophy where the irritability of the heart is greatly increased and where, usually, insignificant exciting causes induce attacks of violent palpitation extremely distressing to the patient.

Here, for instance, is a tracing of the radial artery of a medical student with ordinary aortic insufficiency and perfect compensative hypertrophy. (See Fig. 6.) Under the sustained excitement of an

FIG. 6.



Persistent distention of radial artery in a case of aortic insufficiency from rapidly succeeding heart-beats. Pulse 186.

impending examination, a violent palpitation was induced in which the cardiac pulsation attained a frequency of 186 to the minute, and the arterial system was kept in such a condition of high tension by the rapidly succeeding contractions that the characteristic appearance of the tracings, the defects, are destroyed. In twelve hours this condition was relieved and the patient made comfortable by the administration of tincture of aconite in doses of two drops given every two hours.

The same results may be readily obtained by the use of *veratrum viride* (Norwood's tincture). Drop doses of the tincture administered



hourly will often achieve most satisfactory results. Such remedies, however, are only of temporary benefit, and can only do harm if used persistently. Should undue action of the heart recur with great frequency and under only slight provocation, the addition of a full dose of a bromide is often of marked advantage. Often a period of long quiescence may be secured by continuing the bromide for some days after the subsidence of the attack. The judicious use of digitalis, strophanthus, etc., will often bring about the same results in slowing the excited heart-action, but these drugs are less efficacious than aconite and veratrum viride, and it goes without saying that it should never be given systematically so long as there is compensative hypertrophy. While aortic insufficiency continues compensated, the use of drugs having direct action upon the heart, except as just indicated, is nearly always injudicious, even harmful. The organ may be trusted to make better provision for the performance of its work than we can devise for it.

Our efforts should be directed towards rendering its task less difficult by teaching our patient how to avoid those influences which make its burdens harder to bear. These efforts should take two directions. We should endeavor to protect the heart from a continuation or recurrence of those injuries that have determined the original disordered action, and we must guard against conditions that throw additional stress upon it. Recurrent attacks of rheumatism or gout should be averted by timely hygienic measures. Undue cardiac excitement may be averted by avoidance of prolonged and violent physical effort. Systematic athletic exercises under judicious direction are beneficial, but the active exertion of foot-ball, base-ball, tennis, rowing, running, la-crosse should be prohibited. Similarly the hod-carrier, the stevedore, the bearer of burdens must find other occupations. The man of leisure may prolong his life in comparative comfort for many years. The laborer who must work without reference to his physical defects is often hurried along the road to death. The rules do not always hold, however; we often see steady progress in those whose circumstances permit the most zealous care, and are astonished to see exhausting labor performed by men who have for years had aortic insufficiency with corresponding cardiac hypertrophy. The danger of sudden death from syncope should never be forgotten, and all precautions should be taken to protect the heart from the sudden over-distention that is the cause of it. Violent passion, violent effort, violent emotions have often precipitated the fatal seizure. As the cardiac hypertrophy reaches that degree where relative insufficiency of the mitral valve is induced or when the hypertrophied muscle slowly degenerates and yields to the

ever-increasing eccentric pressure within the ventricle, the dangers of passive venous hyperæmia are added to those already present, and our remedial efforts must be directed against the new order of things. Agents that depress the heart's energy must now be carefully avoided, and those that increase its power resorted to. Digitalis, strophanthus, convallaria, caffeine, and the series of so-called heart tonics should be employed. Unhappily, one cannot often obtain the favorable results so frequently seen to follow the use of these agents in cardiac dilatation and degeneration following mitral insufficiency or the changes of advanced life. The combined valvular defects render these offices more difficult. They should be employed, however, for often their good effects may be observed. After mitral insufficiency and excessive uncompensated dilatation have become established, the general treatment practically becomes that of ordinary uncompensated mitral regurgitation, but with more incessant watchfulness against the now more threatening fatal syncope.

Throughout the course of the disorder under consideration the habitual use of alcohol, tobacco, tea, coffee, and of the various narcotics and stimulants should be strongly discountenanced. The guarded use of alcohol after cardiac weakness begins may often do good, but infinitely more harm than good is frequently done by it, and in the stages of compensation it is only to be recommended when syncope threatens. Whatever favors easy digestion, whatever promotes the ordinary processes of assimilation, tends to lighten the labors of the heart and to promote comfort and prolong life.



## HODGKIN'S DISEASE.

CLINICAL LECTURE DELIVERED IN THE THEATRE OF THE MONTREAL  
GENERAL HOSPITAL.

BY RICHARD LEA MACDONNELL, B.A., M.D.,

Professor of Clinical Medicine in the McGill University ; Physician to the Montreal  
General Hospital.

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GENTLEMEN,—The patient I present to you to-day some of you may remember having seen in the operating theatre last August, when Dr. Shepherd removed from his neck some glands which were causing suffocative attacks by pressing upon the trachea. He is the subject of lymphadenoma, and it is for the purpose of allowing you to study the clinical history of this disease that I have induced him to come to the hospital to-day.

Some weeks ago I brought this man to the meeting of the Medico-Chirurgical Society of this city. The printed report of his case, taken from the Proceedings of the society, I now hold in my hand, and with this as my text, I shall proceed to make comment on the instructive points of the history.

His age is twenty-five, a common enough age for Hodgkin's disease to begin to show itself. In the two other cases I have had under my care the ages were fifteen and twenty. About thirty per cent. of such cases are under twenty. Three-fourths of all reported cases are males. My other patients were both girls. Occupation, heredity, syphilis, and tuberculosis have not yet been shown to influence the etiology. He is employed in checking freight at a railway depot. The family history is negative. He has never had any venereal disease. He married very young and is the father of two children. Up to four years ago he had enjoyed good health, but at that time he suffered from a very severe attack of "bronchitis." During this illness, he tells us, there were severe and sudden attacks of dyspnoea, which came on while he was at rest as well as when exerting himself, and his cough at this period was brassy and resembled the cough he had before Dr. Shepherd

removed the glands which were pressing upon the trachea. This attack of "bronchitis" I look upon not as being the result of common inflammation of the bronchi, but as being of the character of tracheal irritation similar to the condition he was in before the operation. The brassiness of the cough and the urgency of the dyspnœa suggest this interpretation. He made a good recovery, however, and remained quite well until two years ago, when he noticed, for the first time, the swollen glands in the neck, which were then very small and have been gradually increasing in size and number up to the time he came under treatment here. Now, it would seem that the thoracic glands became involved very early in the history of the case. This I infer partly from the history of the so-called bronchitis, and again from the fact that his breathing became very seriously embarrassed last summer (you see that the cervical glands are but slightly enlarged), and he suffered from several severe suffocative attacks, and found himself unable to lie down upon his back. He also complained at this time of hoarseness, and went to consult Dr. Birkett, who has been good enough to furnish me with this report.

Dr. Birkett said, "I examined this patient for the first time on 6th June last, when he complained of hoarseness which had been present for the last two weeks; there was also considerable dyspnœa. Laryngoscopic examination proved the presence of a small superficial ulcer situated on the middle third of either vocal cord, and directly opposed to each other. The base of each ulcer was pale, and the surrounding tissues slightly hyperæmic. The pharynx was decidedly anæmic. The lymphatic glands in the neck were found to be enlarged, especially those about the sterno-mastoid muscle; the three lobes of the thyroid were also found to be enlarged. Thinking that this was a case of tuberculosis with laryngeal manifestations, I proceeded to examine the lungs, but a careful examination failed to discover any lesion in this region. The temperature was slightly elevated ( $100^{\circ}$ ) and the pulse 96. This, in conjunction with the foregoing laryngeal condition, led me to regard the case as one of localized tuberculosis, due, probably, to a caseating degeneration going on in the enlarged glands of the neck; but to have more satisfactory proof, Dr. Johnston kindly examined the sputum, and reported the absence of either tubercle or elastic tissue. Upon this evidence I regarded the laryngeal condition as one of chronic laryngitis, in which superficial ulceration had taken place. Before I received the report from Dr. Johnston, I treated the case as one of tuberculosis, and used lactic acid of varying strengths,—namely, twenty per cent. to eighty per cent.,—with the result that the ulcers healed within



two weeks. At this time I thought I had cured a case of tuberculosis of the larynx, but the result of the examination of the sputum put this idea to one side, and I regarded it in the light previously expressed, that it was a case of ulcer of the vocal cords occurring in the course of a chronic laryngitis. About the 1st of August the dyspnœa began to increase, and laryngoscopic examination showed that there was pressure on the anterior wall of the trachea, due, undoubtedly, to an enlarged gland situated on the middle lobe of the thyroid. As the dyspnœa continued to increase, I advised surgical interference, which was undertaken by Dr. Shepherd, and followed by considerable relief to the distressing symptoms."

Dr. Birkett referred him to me, and, on our recommendation, the gland pressing upon the trachea and causing the suffocative attacks was removed. The operation was a complete success and the distressing symptoms were relieved. The chain of glands was found to extend very deeply into the chest and was continuous with other enlarged glands in the mediastinum. He still suffers from occasional cough, but it has lost its brassy character, and there is still moderate dyspnœa upon exertion.

The glands in the left side of the neck are moderately enlarged and prominent, distinct from one another, loosely attached, and of a firm structure,—not in the slightest degree tender. On the right side of the neck there is one enlarged gland. The result of this glandular enlargement is to thicken the neck. He tells me that latterly he has been obliged to wear a 16½ collar, a large size for a man of his build. In each axilla there are two or three slightly-enlarged glands, but those in the groin are as yet unaffected. It is a common occurrence for these glands to escape. Now, Hodgkin's disease is described as affecting principally the lymphatic glands and the spleen. We find here evidences of moderate splenic enlargement. The area of dulness is enlarged, but not to such an extent as to reach the margin of the ribs. I cannot make out any enlargement of the liver. Examination of the urine gives a negative result. The heart-sounds are normal. At the apex of the left lung there is a slight loss of percussion-resonance over an area limited above by the clavicle and below by the lower margin of the second rib, and there is here a slight increase in the vocal resonance. Looking closely at the surface of the chest, it appears to me that this left infra-clavicular fossa is unduly prominent. At all events, instead of its being more depressed than its fellow, as one would expect to find it in ordinary consolidation in pulmonary tuberculosis, it is as prominent as the corresponding area on the opposite side, if not more so.

I am inclined to think that this obscure dulness is due to enlargement of glands within the thorax. No other physical signs of disease in the lungs are present. There are normally eight or ten glands (superior mediastinal glands) situated behind the sternum between the two pleuræ, and we know from the result of the surgical operation that these are enlarged. It is not improbable that these may be very large and may be compressing the apex of the left lung. All along we have the history pointing to a considerable degree of enlargement of the thoracic glands. To this point I shall have to allude later on.

Patients with Hodgkin's disease are generally anæmic, and our patient here is no exception to the rule. Two examinations of the blood have been made, one here in hospital and one in the pathological laboratory of McGill College. The results in both cases agree. Dr. Wyatt Johnston reports the condition of the blood to be one of moderate leucocytosis. The amount of hæmoglobin and the number of the red corpuscles are normal. The result of this examination accords with what is generally observed in such cases.

This man's temperature is now  $100.4^{\circ}$  F. (at 11.30 A.M.), and, although I have taken his temperature at various times of the day, I have never yet found it normal. It is generally about  $99\frac{1}{2}^{\circ}$  to  $100\frac{1}{2}^{\circ}$  F. In cases which are further advanced the fever runs high. In one of my cases it went up to  $103^{\circ}$  F. at night, dropping in the morning to nearly normal.

At this stage I shall sum up the symptoms present and give the points on which the diagnosis of Hodgkin's disease is based. It is with chronic adenitis of scrofulous origin that we are likely to confound it. (1) There are no signs of the scrofulous habit. (2) The glands affected—the post-cervical—are those most commonly attacked in Hodgkin's disease, and here these were the first to become enlarged. (3) The glands are perfectly distinct from each other, hard, and have no tendency whatever to suppurate. (4) The enlargement extends to the axillæ and thorax.

The absence of tubercle bacilli and of elastic tissue in the expectoration, as well as the absence of symptoms or physical signs (save the suspicion of left apex dulness, which I thought due to enlarged glands), exclude tuberculosis.

Symptoms such as these admit of no other interpretation, but I wish to bring to your notice a number of other symptoms which are present, and which, although they do not belong to Hodgkin's disease, are the indirect effects of it.

I. If we examine him attentively as he lies stripped before us, we



observe that his skin is somewhat clammy generally. He tells us that he perspires freely on very slight exertion. He is not perspiring now, but I may tell you that ever since I have had him under observation there has been profuse sweating on one side of the face,—viz., the left side,—especially over the forehead. In the hot summer months, when he used to walk up the hill to my house to consult me, I could see the sweat in large beads covering the left side of his forehead, while the right side was comparatively dry. On laying a strip of blotting-paper across the forehead, one-half became saturated while the other remained quite dry.

II. *The left pupil* is manifestly larger than the right. You can all see that. This peculiarity was present the first day I saw him and it has been present ever since.

III. While examining him he mentioned his having suffered from bleeding of the nose. On close questioning now it appears that these bleedings, though frequent, were insignificant, but they invariably *came from the left nostril*.

IV. His pulse is now 120. This is high, but we might account for vascular excitement by the fact of his being at present under examination; but *his pulse has never, to my knowledge, been slower than 100*.

V. The thyroid gland is enlarged.

VI. There is a history of syncopal attacks.

VII. The left ear is subject to deep blushing. The patient says he can feel it burning and can notice the redness in the looking-glass.

All these symptoms point in the one direction,—viz., interference with the sympathetic nerve. The point of pressure is not so likely to be in the neck, because there the glands are small, but in the upper part of the thorax the structures are tightly packed together. And I have pointed out that, for several reasons, it is likely that the glands in that locality are considerably enlarged. The point of pressure in that case would probably be in the root of the neck, because it is most probable that the anterior mediastinal glands are enlarged. We have already evidence of the intensity of the pressure, because the trachea was pressed in by glands which were dragged out from between it and the manubrium. At this point the sympathetic cord passes along the back of the thorax, and it is so situated, lying against a hard body, as to be susceptible of very little extra pressure. And we know that in thoracic tumors of all kinds it is prone to suffer. Now, all these symptoms which I have enumerated depend upon this pressure. The sweating noticed on the left side of the face is due to the irritation of

the sympathetic nerve in the root of the neck. The sweat-fibres which accompany the cutaneous distribution of the fifth are irritated, and sweating takes place, just as it would occur if the sympathetic in the neck of an animal were mechanically irritated.

The continued dilatation of the pupil is due to the same cause,—viz., irritation which is conveyed along the sympathetic to the ophthalmic ganglion and on to the iris. Perhaps some of you may remember a case of aneurism of the transverse arch of the aorta which I made the subject of a clinical lecture this time last year. In that case the pupil was closely contracted on the affected side, but there was no sweating. The difference lies in the degree of pressure. Moderate pressure irritates and stimulates, tight pressure paralyzes and destroys the nerve.

The repeated slight bleedings always from the left nostril are further evidences of interference with the sympathetic. The blood-supply of the mucous membrane of the nose is interfered with, and congestion of the capillaries and venules is the result.

It puzzled me to account for the nasal hemorrhage in conjunction with dilated pupil, for in the record of similar cases the pupil has been contracted. On questioning the patient closely, I found that the epistaxis was no longer present, and that in point of occurrence it coincided with a period of the disease in which there were severe suffocative attacks and in which the pressure was evidently greater than it is at present.

The connection between disorders of the nasal mucous membrane and disorders of the sympathetic is very close and requires careful study. Not long ago a connection between Graves's disease and nasal symptoms was pointed out. In many cases of exophthalmic goitre nasal symptoms preceded the general disease.<sup>1</sup> But a very remarkable case was reported in London by Semon, of St. Thomas's Hospital, from which it appeared possible that intra-nasal operations might produce, at all events, exophthalmos. I merely mention this as an interesting connection, for it is by no means acknowledged that exophthalmic goitre is a disease of the sympathetic.

The persistently-accelerated pulse is another result of the irritation of the sympathetic. The accelerator fibres of the heart are derived from the sympathetic,—that is, in all animals thus far examined,—and are given off either from the first thoracic ganglia or from the inferior or middle cervical ganglion. Here it is most probable that

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<sup>1</sup> Montreal Medical Journal, vol. xvii. p. 617, vol. xviii. p. 99.



the inferior cervical ganglion or the first thoracic ganglion is subjected to pressure by the enlargement of the glands. It lies opposite the neck of the first rib, close to the first thoracic ganglion, to which it is closely united. To quote the comment made by Professor Mills at the meeting of the Medico-Chirurgical Society, at which this patient was exhibited, "In man it was likely that the most important branches were derived from the middle cervical ganglion. Sympathetic fibres ran also in the vagus stem itself. It was possible to understand the cardiac acceleration from an irritation of these fibres, and this was in harmony with the sweating and the dilatation of the pupil."

The enlargement of the thyroid gland may be explained in several ways. In the first place, it is very vascular, and, if sympathetic disturbance can bring about turgescence of the nasal mucous membrane, it is highly probable that the same may occur in connection with the thyroid. As a clinical fact, enlarged thyroid is not uncommon in Hodgkin's disease.

Syncopal attacks are not uncommon in Hodgkin's disease. This patient suffered from a severe one a few weeks ago. Their origin may be nervous or it may be mechanical. A physiological explanation was furnished me by Professor Mills, in the possibility that the syncope "might arise from inhibition by the inhibitory fibres proper in the vagus, or from exhaustion consequent on the undue action of the sympathetic, and the latter seemed in the present instance the more likely."

Mechanical compression of the carotid artery and the cutting off of blood-supply to the brain might also explain the syncope. It is significant that the attack came on while he was lying down.

**Treatment and Prognosis.**—The patient having left us, we can now discuss the prognosis and treatment. Two dangers threaten him. At any time other glands, perhaps more deeply seated than the one we have removed, may press upon the trachea or other thoracic organ, or the disease itself may induce a condition of exhaustion. The absence of high fever and the insignificant degree of anæmia present are two important points in his favor. Two years has been put down as the average limit of such cases. The effect of treatment is here most satisfactory. Since he first came under my notice he has steadily been taking Fowler's solution of arsenic in five-minim doses three times a day, and he reports himself as feeling very much stronger and better since he began. I cannot tell you accurately whether he has really gained weight. He says that he has, but patients often deceive us in this matter. At all events, he has not lost a day's work since the operation upon his neck.

## ADDENDUM: REPORT ON BLOOD OF P. T., BY DR. WYATT JOHNSTON.

Blood examined at one P.M., November 17, 1890. Patient says he has eaten nothing since breakfast. On pricking the finger, blood flows readily and is of normal color; the consistency is fully that of normal blood, possibly somewhat more. It coagulates promptly. Microscopic examination without addition of any reagent shows that the red corpuscles are abundant, of normal appearance and uniform size, and tend to form *rouleaux*. No aberrant forms seen, no poikilocytosis. Blood-plates abundant at first; afterwards abundant fine crystalline-looking fibrin filaments exist in large amount with scanty granule masses. The white corpuscles are present in larger numbers than normal, from fifty to one hundred being seen in each field of a Zeiss D lens. There is nothing unusual in their appearance. On fixing the blood and staining it with methylene-blue and eosin, the fragmented nuclear form is found in seventy-five per cent. of all the leucocytes, the remainder being mononuclear cells, with large ill-defined, round nuclei, and very little cytoplasm. No parasites were recognized, and no eosinophile cells found. In a slide of blood which stood for five hours surrounded by paraffin, no Charcot-Neumann crystals were found.

Hæmoglobin index 88 (Fleischl).

Red corpuscles per cubic millimetre 5,010,000 (501 counted).

White corpuscles per cubic millimetre 46,000 (92 counted).

Ratio of white to red 1 to 108.

The condition is one of slight leucocytosis. The amount of hæmoglobin and the number of the red corpuscles are normal.

I have made some cultures from the blood in nutrient gelatin, all of which remained sterile.



## MOVABLE KIDNEY.

LECTURE DELIVERED AT THE HARVARD UNIVERSITY MEDICAL SCHOOL.

BY FRANCIS MINOT, M.D.,

Late Hersey Professor of the Theory and Practice of Physic in Harvard University.

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**Synonymes.**—Floating kidney ; palpable kidney ; dislocated kidney ; nephroptosis.

It has long been known that one and occasionally both of the kidneys are sometimes movable to a greater or less extent, but until the publication of the classical work of Rayer<sup>1</sup> the frequency of this lesion, together with the symptoms accompanying it, and its pathological anatomy were not generally appreciated. This is explained by the fact that the symptoms accompanying floating kidney are often vague and not unfrequently wholly absent. Now, although it might be alleged that a lesion rarely giving rise to grave symptoms is of little consequence, yet, in those cases in which the symptoms are prominent enough to annoy and even alarm the patient, we may sometimes be able to reassure him by our diagnosis of the lesion ; moreover, the accidental discovery of a tumor in the abdominal cavity, sometimes by the patient himself, is a serious matter, so that the exact diagnosis of its nature and seat is a matter of much importance.

The frequency with which floating kidney is noticed has increased of late years, since the attention of clinical observers and pathologists was called to it, and, from having been formerly regarded as a mere curiosity, it is now recognized by most clinicians as by no means rare, though hardly so common as to justify the statement of Kuttner,<sup>2</sup> that it is one of the most common lesions found in women, or the estimate of Lindner,<sup>3</sup> that it occurs in one out of every five or six women,

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<sup>1</sup> *Traité des Maladies des Reins*, par P. Rayer, Médecin de l'Hôpital de la Charité, Paris, 1841, vol. iii.

<sup>2</sup> *Ueber palpable Nieren*, Inaugural-Dissertation, von Leopold Kuttner, Berlin, 1890.

<sup>3</sup> *Ueber die Wanderniere der Frauen*, in Heuser's Verlag, 1888, p. 10.

although their estimates apply to cases in which the kidney can be merely felt by external exploration, as well as to those in which it is freely movable in the abdominal cavity.

The lesion is much more common in women than in men, the proportion being ninety-four per cent. of the former, in one hundred cases personally observed by Kuttner. The largest number of patients (eighty-two) were between the ages of twenty and thirty years; but, including cases reported by other observers, Kuttner found that out of a total of three hundred and twenty-six cases, one hundred and twenty-three were between thirty and forty, more than thirty-seven per cent. As these numbers, however, indicate only the period at which the lesion was noticed, they are obviously of little value, since it might have existed for years before that time. It was observed in five cases by Kuttner in patients below the age of ten years.

**Causes.**—The etiology of movable kidney is very obscure. Perhaps the most plausible explanation of the lesion is the absorption of the capsule, or mass of fat in which the organ is embedded. This capsule, as you know, is situated behind the peritoneum, lying upon the quadratus lumborum and the last two costal attachments of the diaphragm. It is held in position by the tension of the peritoneum which passes over it, and which is attached to the anterior layer of the capsule, as well as the kidney itself, below and laterally. When from any cause, such as general wasting from chronic disease, phthisis, cancer, and the like, the fat of the capsule becomes more or less absorbed, the attachments of the kidney become loosened, and the organ can be readily moved about in the subserous tissue, and tends to sink downward by its own weight, while the covering of the diaphragm has less retaining power over it. The elastic peritoneum yields to the tension, and becomes a sort of mesentery (meso-nephron), gradually allowing a more or less extensive movement to the organ. In favor of this view of a predisposing cause of movable kidney it is stated by Kuttner that the lesion is not seldom met with under such conditions, and even after acute diseases accompanied by much fever, as typhoid fever and intermittent fever; but it should be remembered that it is oftenest in those cases that we have an opportunity of examining for it. Moreover, movable kidney is comparatively common in those who have never been emaciated.

The right kidney is more liable than the left to downward dislocation on account of the pressure of the liver, which under these circumstances is now above it, aggravated by each inspiration, and by coughing, sneezing, vomiting, etc. Moreover, the effect of pressure



from the corset is undoubtedly an important element in the causation of movable kidney, and one which accounts for its greater frequency among women than men.

Relaxation of the abdominal walls from frequent child-bearing or abortions has been considered by several writers as a common cause of movable kidney, but this opinion is not borne out by facts, which show that the affection is quite as common among young maidens and women who have never borne children as with those who have experienced repeated pregnancies.

Cases of movable kidney are reported which were supposed to result from accidents, especially falling down stairs, during gymnastic performances, etc., or from sudden and violent muscular exertion; but the opinion of Drummond<sup>1</sup> and others seems to me more probable, that in the great majority of cases of movable kidney a more or less relaxed condition of peritoneal attachment is congenital, and that the actual condition in these cases is determined by muscular effort, as, for instance, urgent vomiting, asthmatic paroxysms, etc., as well as by the pressure by the corset, a pendulous condition of the belly, etc.

**Symptoms.**—It frequently happens that movable kidney exists without being accompanied by any symptom whatever. It may be discovered accidentally, sometimes by the patient himself or herself, or by the physician. An unmarried lady, twenty-seven years old, of nervous temperament, but otherwise healthy, was under my care in January, 1881, for amenorrhœa, for which she was treated by electricity. On applying the faradic current from the ovarian region of the abdomen to the lower part of the back I noticed a smooth, flat tumor of the size and shape of a kidney in the right hypochondrium, about midway between the costal cartilages and the crest of the ilium. It was quite movable, and could be pushed backward beneath the cartilages into its normal situation. It was free from pain and tenderness. There were no symptoms referable to the tumor, urinary or otherwise, and the patient was and is ignorant of its existence. The tumor was again observed, as before, in April and October following.

An example of the accidental discovery by the patient of a movable kidney, unaccompanied by symptoms, was that of the case of an unmarried woman, twenty-five years old, a domestic, who consulted me December 6, 1886. She had noticed a movable tumor in the right hypochondrium for about a year. On examination there was found in

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<sup>1</sup> Remarks on the Clinical Aspects of Movable Kidney, by David Drummond, M.D., London Lancet, January 11 and 18, 1890.

that region a kidney-shaped and very movable tumor, which could be pushed back beneath the cartilage. It was smooth and slightly tender. There were no special symptoms, and the health of the patient was good.

In a large proportion of cases movable kidney is associated with nervous excitability, and hypochondriasis, which reveals itself by hysterical symptoms, depression of spirits, irritability of temper, habits of self-indulgence, etc., but it is doubtful how far these are dependent upon the abnormal renal conditions, though the latter may tend in some cases to aggravate them.

Among the symptoms which may be specially referred to the kidney the most frequent is a sensation of dragging, with general uneasiness, rarely amounting to pain, sometimes a feeling of weight or pressure, with occasional colicky pain, seated in the hypochondrium, and often extending upward between the shoulders. According to Rayer these sensations may be provoked by pressure on the organ. In other cases there is pain in the lumbar region of the side corresponding to the affected kidney, and shooting downward in the direction of the lumbar and crural nerves, along with a feeling of weakness and discomfort in the lower part of the abdomen. The following case of this kind came under my observation: The patient, thirty years old, was the wife of a mechanic, and had five children, the youngest two years old. She does all her household work, except washing, without much difficulty, can walk easily, and has a healthy look; but at times she complains of loss of strength, and backache is a frequent symptom. Menstruation is regular and normal; no leucorrhœa. For at least ten years she has been conscious of vague pains in the right hypochondrium, with occasional bladder symptoms,—frequent desire to make water, and pain after the last drops of urine are expelled. There is no increase in the quantity of urine. The pain has rather increased of late, it shoots upward towards and to the outside of the right breast, and sometimes extends down the right thigh and leg. The abdomen is quite soft and free from tenderness, so that exploration is easy. Deep below the edge of the right cartilages is felt a smooth, flattish tumor, with rounded inferior edge, of about the size of a kidney, somewhat sensitive to pressure. It is quite movable from behind forward to the extent of about three inches, and can then be pushed backward again towards the spine. The patient had discovered the tumor herself a few days before she came to consult me. Occasionally symptoms attributed to peritonitis have been observed, probably due to the stretching of the attachments of the organ. These



symptoms are sometimes excited or aggravated by active movements, such as dancing, jumping, horseback-riding, etc.

Dyspeptic symptoms are not infrequently complained of by patients with movable kidneys, but in my experience, at least, they are rarely severe. Dilatation of the stomach has been known to accompany the lesion, and has been accounted for by an assumed pressure of the kidney on the duodenal branches of the par vagum nerve, thereby causing retention of the gastric contents. But it is very doubtful whether there is any direct connection between the gastric symptoms and the abnormal situation of the kidney; it is more probable, as Kuttner remarks, that the peristaltic action of the stomach is much too powerful to be resisted by any such nervous inhibitory influence.

One might reasonably ask, What is the effect, upon the kidney itself and its functions, of the displacement of the kidney? Strange to say, symptoms relating to the urinary organs are rarely observed. There may be slight colicky pain in urinating, frequent desire to make water, slight increase in the amount of urine (which is almost always normal in character); but these are for the most part transient and unimportant symptoms. Uterine symptoms are occasionally found along with others complicating these cases,—menorrhagia, amenorrhœa, dysmenorrhœa, displacements, etc.,—and, if no other lesion can be found, they are sometimes ascribed to a movable kidney; but usually these functional derangements are only coincident with that condition, and not dependent upon it. The following case is interesting in this connection.

A medical man asked my opinion in regard to his wife, a rather delicate lady, thirty-five years old, who, four years previously, after a difficult labor, had convulsions, and was blind for more than twenty-four hours. A lacerated cervix remained as one of the results of the labor. Since then the patient had had much ill health, chiefly from dyspepsia, and she also suffered somewhat from menorrhagia. Her husband asked whether I thought an operation for closing the fissure of the cervix would be of permanent benefit to her health. I found that the cervix was fissured throughout its entire extent on the left side, and that the os was consequently much everted, but the surface of the fissure was quite smooth and free from granulations and of normal color. There was no prolapsus. On examining the abdomen a movable tumor was found in the right hypochondrium, corresponding in size and shape to a kidney, which could be pushed beneath the cartilages as far as the dorsal region. On getting the patient to sit up on end, and applying the thumb just below the ribs and close to the

spine, the tumor could be shelled out again from its bed so as to glide beneath the fingers applied to the hypochondrium. It was not easy to say whether the symptoms in this case could be ascribed to the uterine lesion or to the movable kidney, but I am more inclined to blame the former than the latter.

**Diagnosis.**—From what I have already said you can appreciate the importance of accurate diagnosis in all cases of obscure abdominal symptoms associated with nervous or hypochondriacal manifestations, especially in women, who are so liable to them, and in whom also movable kidney is comparatively so frequent. The detection of the lesion is in many cases a most satisfactory explanation of obscure and alarming symptoms, since we are able to assure the patient and his friends that his complaint, if difficult to cure, is at least free from danger. I advise you in all instances of the kind which are rebellious to treatment to make a careful examination before giving a decided opinion, in the case, both for the welfare of your patient and for your own reputation. By so doing you may save yourselves from the mortification of having the lesion pointed out by another physician, and your patient will be gratified by your discovery of the seat of his (or her) disease, especially if assured that it is not a dangerous one.

There is but one way by which the diagnosis can be ascertained with certainty, and that is physical exploration, which, if properly made, rarely fails to reveal the presence of an existing movable kidney; but if it be carelessly or ignorantly performed, it is apt to yield no satisfactory result. The patient should, if possible, be in bed; if not, the clothing should be loosened, so that the abdomen can be exposed for examination; in female patients the corset should either be removed or so much loosened that it will not compress the thorax in the least. The patient's thighs should be well flexed upon the pelvis in order to relax the abdominal wall. Standing on the right side of the patient (in searching for the right kidney), we place the left hand beneath the lumbar region, as he lies in the dorsal position, just below the twelfth rib, while with the tips of the fingers of the right hand we make gentle pressure on the abdomen in the upper and middle region of the hypochondrium. If the kidney be displaced to any extent, we feel a flat, smooth, roundish body, which can often be pushed about in various directions, sometimes as far as the crest of the ilium. If the tension of the abdominal wall be so great as to interfere with the exploration, the patient must be directed to take a full inspiration, and during the following expiration the relaxation of the muscles will generally enable us to feel the organ. In some cases it is possible to feel the hilum



of the kidney, and even the pulsations of the renal artery. It not unfrequently happens that in consequence of some sudden movement or change of posture by the patient a movable kidney will slip back into its normal position, so as to be no longer felt in the abdomen. Hence, it is important, when the result of the abdominal exploration is negative, to press with the fingers of the left hand upon the lumbar region, just below the twelfth rib, and in this way to shell it out, as it were, when it will often glide beneath the fingers of the other hand. It may happen, however, that in spite of all our efforts we cannot dislodge the kidney after it has retreated into its bed, and I have had one case in which the lesion was observed and recorded in my notes three times, at intervals of several months; some time after the last record, however, when the patient came again, I was unable to detect it. Sometimes making the patient sit up "on end" facilitates the exploration, or the "knee and elbow" position will cause the kidney to fall by its weight from beneath the cartilages, and the standing position is also recommended by some writers. This occasional disappearance of a movable kidney makes it important to record its presence each time it is found, as evidence in favor of your diagnosis, should it be disputed by another physician who happens to be less fortunate. Kuttner records such a case: a few hours after he had clearly demonstrated the presence of a movable kidney, the patient having meanwhile partaken of a meal, he was unable to find it again.

In respect to the differential diagnosis, if the right kidney be the one supposed to be affected, hardly any difficulty can arise, there being no organ in the right hypochondrium which could easily be mistaken for a kidney, considering the facility with which its outline can be traced, and especially the ease with which it can be made to change its place. Small tumors of the omentum or mesentery, a distended gall-bladder, an hepatic cyst, or a faecal mass in the colon might possibly at first suggest a movable kidney; but careful examination would almost always reveal their true nature, and, moreover, they are not movable, or only slightly so. When the abdominal walls are much thickened by adipose tissue, it may be very difficult or even impossible to distinguish between a floating kidney and a movable cyst. Such was the case of a young married woman whom I saw in consultation a short time ago. Her attention was first drawn to her increasing size, which made her suspect that she was pregnant (she had two children already), but her physician had detected a tumor in the right side of the abdomen, which he supposed to be an ovarian cyst. The patient was quite stout, and the abdominal parietes were so loaded with fat

that I could come to no decided opinion on the question from palpation. The tumor was smooth and somewhat movable, but it seemed too large for a kidney. On the other hand, its lower border was above a line drawn from the superior process of the ilium to the navel; which would be unusual for an ovarian cyst. The patient was in excellent health, and there were no signs of pregnancy. On the whole, I was inclined to hope that the tumor was a movable kidney, but it was impossible to give a positive opinion until a later period.

There might possibly be some difficulty in distinguishing between a kidney of the left side and a very small and movable spleen. Such a case came under my notice a few years ago. A laboring man, fifty-five years old, consulted me for a tumor in the left hypochondrium, about as large as an orange. It was spheroidal, somewhat irregular on the surface, hard, painless, and not tender. It could be moved about easily, especially in the vertical direction, the lower end reaching two inches below the level of the navel, and it could be pushed almost completely beneath the cartilages. The patient's health was always good till about a year previously, when he began to lose strength and flesh. He had discovered the tumor five months before, and it had not increased in size since. He was born in Ireland, had lived in Boston for the last thirty years, and nowhere else in America. He had never had intermittent fever. The shape and the surface of the tumor was, of course, very unlike that of a kidney, but such anomalies in the shape of this organ are not excessively rare, and Dr. Formad<sup>1</sup> has described, under the name of "pig-backed" or alcoholic kidney, a deformity resembling the one in this case, which it seems is common among drunkards. I thought the tumor was probably a kidney, but I was unable to give a positive opinion.

A very interesting case of left movable, cancerous kidney, resembling a spleen, was reported by Professor F. C. Shattuck in the *Boston Medical and Surgical Journal* for March 24, 1887.

It seems strange that a case of movable kidney could ever be mistaken for pregnancy, but I saw such a one a year ago. A woman, twenty-five years old, married two years, had nausea and some other subjective symptoms, from which pregnancy was diagnosticated by a physician who thought he felt the foetal movements and could count the pulsations of the foetal heart. During all this time, however, the menstruation continued with perfect regularity, and the subjective

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<sup>1</sup> The "Pig-Backed" or Alcoholic Kidney of Drunkards, by H. F. Formad, M.D., Transactions of the Association of American Physicians, vol. i. p. 237.



symptoms gradually disappeared. Meanwhile, the patient herself discovered a small movable tumor in the abdomen which another physician recognized as a kidney. On examination I found no signs of present or previous pregnancy in the breasts, abdomen, or pelvis. Below the middle of the right costal cartilages could be felt a round, smooth body of about the size and shape of a watch. It was quite movable, and could easily be pushed back with a jerk, so as to disappear beneath the border of the cartilage, especially at the end of the movement of expiration, returning again during inspiration. There was no pain.

Lastly, there is no doubt that in many cases of dyspeptic symptoms (so called) a careful exploration of the abdomen would reveal the presence of a movable kidney which otherwise would be overlooked.

**Prognosis.**—It is satisfactory to be able to say that movable kidney is never fatal, though incurable except sometimes by surgical treatment. In a considerable number of cases there are no symptoms which would cause any suspicion of its existence, and, as I have already said, it may be discovered quite accidentally during lifetime, or only be revealed at an autopsy. When the existence of the lesion becomes known, accidentally or otherwise, to the patient, it is safe to assure him that it is of itself of little or no importance in the great majority of cases. In the words of Trousseau,<sup>1</sup> the lesion only becomes serious in consequence of the errors in diagnosis to which it may give rise, and the treatment which is usually active in proportion.

**Treatment.**—We may divide the subject of the treatment of movable kidney into that relating to the means of replacing the dislocated organ and retaining it in its proper place, and that of relieving the subjective symptoms which are either dependent upon the lesion or which simply accompany it.

In most cases it is easy to restore the kidney to its normal situation, but very difficult to keep it there. Sometimes, especially in patients with pendulous bellies, a simple bandage around the lower part of the abdomen, such as is occasionally worn during pregnancy, affords relief. In others, a bandage for the upper part, with a pad corresponding to the hypochondrium and pressing below the kidney, after reduction answers better. These bandages should be made and fitted by a skilled workman. Unfortunately, such appliances are difficult to keep in place, and hence are often unsatisfactory. Extirpation of the affected kidney has been tried in a number of cases, but the result is so unsatisfactory

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<sup>1</sup> A. Trousseau, *Clinique Médicale de l'Hôtel Dieu de Paris*, 1865, vol. iii. p. 772.

that the operation has, I believe, been abandoned. The attachment of the kidney to its position by means of stitches has also been performed, and is a much less dangerous operation than extirpation. In some instances relief has followed, but I am not aware that any case of permanent benefit after nephrorrhaphy has been recorded.

For the relief of the dragging and shooting pains which sometimes accompany movable kidney, external applications may be employed, such as chloroform and other anodyne liniments, wet compresses, hot poultices, etc. In severe cases morphine must be given. Rest in bed will often be necessary, and after relief is obtained the patient should abstain from much exertion as long as possible. Attention should be paid to the condition of the bowels, and the diet should be light, but nutritious. The victims to this complaint are often chlorotic and feeble, and the different preparations of iron and other tonics may be prescribed with much benefit.

The nervous symptoms are in many cases also associated with, if not caused by, a debilitated state of the health, which requires a tonic treatment, especially iron in some of its forms. Change of scene, travelling, a residence in a mountainous region, or by the sea-side are often of much benefit. The moral effect of a favorable opinion by a competent physician, the assurance that the case is not one of "tumor" or other fatal disease, may do wonders in restoring the patient's health.

It may be a question whether we should impart to the patient the knowledge that he has a movable kidney. The answer should depend upon circumstances. When the lesion is associated with the symptoms which I have tried to describe, the patient or his friends ought always to be informed of it, in justice to the physician, who might be blamed for his want of skill should it be afterwards detected by another. If the movable kidney should be accidentally discovered in a case in which there were no symptoms, as in one of those which I have quoted, it might be best not to needlessly alarm a timid person by acquainting him with it. In any case you should always make a record of the fact in your note-book, to serve for reference if necessary.



# THE EXAMINATION OF THE SPUTUM FOR TUBERCLE BACILLI, AND ITS BEARING ON DIAGNOSIS AND TREATMENT.

CLINICAL LECTURE.

BY PERCY KIDD, M.D., F.R.C.P.,

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late Pathologist, to the Brompton Hospital for Consumption and Diseases  
of the Chest.

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THE statement may now be made, without fear of contradiction, that the discovery of tubercle bacilli in the sputum is a positive proof of the existence of tuberculosis of some part of the respiratory system. It will hardly be questioned that the establishment of this fact constitutes the most important advance from a diagnostic point of view ; but we may go further and assert that the increased precision of diagnosis thus obtained exercises a most potent influence on the all-important subject of treatment. For the fundamental discovery of the pathogenic relations of the tubercle bacillus we are indebted to the genius of Robert Koch, but it is mainly through the researches of Ehrlich that the application of Koch's discovery to the needs of clinical medicine has been brought to so successful an issue. Thanks to the improved methods devised by Ehrlich, it is possible for every physician to learn with a small amount of practice to prepare a specimen of the sputum for examination in a few minutes. A brief account of the method of preparation may be given before proceeding to discuss the clinical aspect of the question.

In the first place, care must be taken to obtain a sample of the patient's sputum that comes from the respiratory passages or lung itself. When the expectoration is very scanty, it will often be found to consist mainly of pharyngeal mucus. Secretion from this part is commonly very tenacious and is expelled by forcible hawking efforts. At other times the sputum is composed of little more than saliva. The best plan is to direct the patient to collect in a clean vessel the

morning expectoration, which is generally voided with less effort, and, representing, as it does, the secretions accumulated during the hours of sleep, is more likely to contain a mixture of the sputum from different parts of the respiratory tract.

In order to select a portion for microscopical examination, it is well to pour the expectoration into a flat glass dish and then to inspect its macroscopic characters against a dark background. The most suitable parts are the yellowish streaks or specks which can generally be recognized even in what may appear at first to be a purely mucous sputum. Where the expectoration is more or less opaque or yellow throughout, the thickest and most opaque or curdy parts are to be chosen. To remove the requisite portion we may use a small scalpel, a stout platinum wire with a loop at the end, or, as Ehrlich recommends, a fine steel pen with one of the nibs broken off and mounted on an ordinary penholder. A minute quantity of the sputum is transferred to a perfectly clean thin cover-glass, and another clean cover-glass is placed on the first. The two glasses are then gently pressed together between the thumb and forefinger, or with a pair of clean forceps, so as to spread out the sputum in as thin a layer as possible. The latter plan prevents any oily matter from the fingers becoming deposited on the cover-glasses. If the sputum be very tenacious and will not spread out easily, it should first be allowed to dry partially, and now when the glasses are pressed together it will be easily distributed in a thin uniform layer on the two surfaces. The cover-glasses are then separated by a sliding movement and are allowed to dry thoroughly. Next they are picked up with forceps and rapidly passed, face upward, three times through the flame of a Bunsen burner or spirit-lamp to coagulate the albumen, after which they are ready for staining.

The following reagents are required :

1. A solution of fuchsine, or magenta, either (*a*) Ehrlich's solution, consisting of eleven cubic centimetres of a saturated alcoholic solution of fuchsine and one hundred cubic centimetres of a saturated watery solution of aniline oil. This solution will not keep more than a fortnight, and is best prepared freshly each time it is wanted. Or (*b*) Ziehl's solution, consisting of ten cubic centimetres of a saturated alcoholic solution of fuchsine and one hundred cubic centimetres of a five-per-cent. watery solution of carbolic acid. This solution is much more stable, and may be safely used for months.

2. A solution of one part of commercial nitric acid to three or six parts of water.



3. A concentrated watery solution of methylene blue.

Ehrlich recommends that a few drops of acetic acid be added.

The cover-glasses are now floated, face downward, on some of the freshly-filtered fuchsine solution in a watch-glass or shallow glass capsule, and the fluid is heated on a sand-bath or over a spirit-lamp until bubbles begin to rise. Heat is then removed, and the specimens are allowed to remain in the hot solution for four or five minutes longer. The cover-glasses are next removed with forceps, the excess of fuchsine shaken off, and they are dipped into some of the nitric acid for two or three seconds, and then quickly washed for about ten seconds in a gentle stream of water flowing from a tap. The sputum, which has a deep-red color when removed from the fuchsine, acquires a yellowish-gray appearance when placed in the acid, but when washed in water the red color reappears. The cover-glass is now floated in a small quantity of the blue fluid for about a minute, after which it is washed again in a stream of water for about five or six seconds. The excess of water is then drained away and the cover-glass allowed to dry. Drying may be hastened by gently pressing the cover-glass between layers of filter-paper. The dried cover-glass is finally mounted in a drop of Canada balsam dissolved in benzol or xylol, and is now ready for examination.

With this method of preparation the tubercle bacilli appear as delicate red rods varying in length from one-quarter to one-half the diameter of a red blood-corpuscle. The bacilli may be stained a uniform bright crimson; the staining may be unequal, leaving small unstained areas; or the micro-organisms may present a beaded appearance, giving the impression of a string of red granules. The last mode of staining has been attributed to the presence of spores contained in the sheath of the bacillus. No definite importance can be attributed to these morphological differences. Various other bacilli and micrococci present in the sputum, as well as the nuclei of cells and threads of mucin, take the blue stain, contrasting strongly with the red tubercle bacilli.

Ehrlich explains the results of his method as follows:

For the efficient staining of the tubercle bacilli the combination of a salt of aniline with aniline itself is necessary. The double compound thus formed is an oily, comparatively insoluble substance of a very brilliant color, which becomes deposited in the protoplasm of the bacilli and cells generally. It is known that tubercle bacilli take up watery solutions of the aniline dyes with difficulty, but they are readily stained when certain of these dyes are combined with aniline-phenol. Ehrlich concludes that the bacilli are provided with a delicate sheath endowed

with certain peculiarities. This sheath resists the passage of watery and acid solutions, but is readily permeated by alkalies and oily substances like aniline and phenol. The aniline therefore plays a double rôle: it combines with one of its salts, fuchsine (hydrochlorate of rosaniline), to form a pigment of the requisite brilliancy; and it also moistens or alters the bacillary sheath in some way so as to allow of the diffusion of the pigment into the protoplasm of the bacillus, where it is deposited in fine particles.

When a strong mineral acid like nitric acid comes into contact with the pigment, it converts it into a very soluble triacid salt, and thus the cells, mucin, etc., are decolorized, but, owing to the resistance of the sheath of the bacilli, the acid does not come into contact with the pigment deposited in their protoplasm for some time, and the staining persists.

Prolonged exposure to the action of the acid results in decolorization of the bacilli also, but for a certain period of time, which varies somewhat, the addition of water causes the red color to reappear. This is believed by Ehrlich to depend on the decomposition of the triacid salt, by water, into the mono-acid pigmented salt and free acid, and he supposes that, through the prolonged action of the strong acid on the delicate sheath, the latter becomes so altered that it permits the diffusion of the comparatively small molecule of nitric acid but resists the passage of the highly complex and large molecule of rosaniline hydrochlorate. Consequently, the pigment remains deposited in the body of the bacillus.

For the examination of the preparation of sputum a magnifying power of about two hundred and fifty to three hundred is sufficient if the illumination be brilliant. Abbe's substage condenser is a great help and renders the detection of the bacilli much easier, and, in doubtful cases where the bacilli are very scanty, the combination of Abbe's condenser with a one-twelfth oil immersion lens is to be recommended.

Having described the mode of preparation of the sputum, we may now proceed to discuss the practical application of the test. In the first place, it may be freely admitted that in many—indeed, in most—cases of phthisis examination of the sputum is unnecessary, or, at the most, merely corroborates the diagnosis arrived at by the ordinary methods of examination.

The physical diagnosis of pulmonary tuberculosis rests mainly on the recognition of localized disease of the apex of one or both lungs.



But much difficulty is apt to arise when the localization of phthisis is atypical,—for instance, in the basic type. Again, there are conditions liable to develop in the course of this affection which may to a great extent, or altogether, mask the true nature of the complaint,—*e.g.*, general bronchitis, especially when associated with emphysema, pleurisy, with or without effusion, obstructive disease of the larynx, etc. In such cases it may be impossible to form a positive diagnosis, but the sputum-test may at once solve the difficulty.

The cases referred to fall into five main clinical groups:<sup>1</sup> 1. Cases with no physical signs of pulmonary disease. 2. Cases of laryngeal disease without definite pulmonary signs. 3. Cases of bronchitis and emphysema. 4. Cases with physical signs of pleurisy. 5. Cases with physical signs of doubtful import.

In speaking of the individual groups only one case will be given under each heading, owing to considerations of space.

#### GROUP I.—CASES WITH NO PHYSICAL SIGNS OF PULMONARY DISEASE.

It is no unusual thing to meet with patients whose history and symptoms are strongly suggestive of phthisis, but in whom physical examination of the chest yields a negative result. It is obviously of the highest importance to the patient that the physician should make a correct diagnosis, as his prospects in life may hang on the verdict. If phthisis be present, the patient should be warned that serious disease exists, and he should be urged to make considerable sacrifices in order to promote a cure. If the evidence of phthisis be very doubtful, we should hesitate to advise him to give up his work or incur the expense of a journey to some distant health-resort. The following is an illustration of the importance of the sputum-test in such circumstances.

Mr. A., aged thirty, had suffered from slight cough and expectoration for some months, when he was surprised by a sudden attack of hæmoptysis, since which time there had been slight loss of flesh and weakness. Three weeks afterwards a careful examination of the chest was made, but no physical signs of disease could be detected. The patient had been previously seen by two eminent physicians, and the result of their examination had also been negative. The sputum, which was almost entirely mucous and very scanty, was found to con-

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<sup>1</sup> Suggested by the writer and Mr. H. H. Taylor in a paper on the subject published in the *Med. Clin. Trans.*, vol. lxxi.

tain a few tubercle bacilli. The patient was advised to reduce his very heavy professional work, which he did to some extent. Four years have now elapsed, and, although no further opportunity of examining the chest or the sputum has been afforded, he has been frequently seen by the writer in a social way, and it is known that he has recovered and is able to carry on his professional work without difficulty.

GROUP II.—CASES OF LARYNGEAL DISEASE WITHOUT DEFINITE PULMONARY SIGNS.

Every laryngoscopist knows how difficult it is at times to distinguish tubercular from syphilitic lesions of the larynx, especially when the patient has unquestionably contracted syphilis. Malignant disease may also occasionally be simulated. If physical examination reveal signs of apical disease, the tuberculous nature of the laryngeal affection may be almost certainly assumed. But in cases in which laryngeal stenosis is involved, examination of the chest frequently reveals no definite morbid signs, or, at the most, the evidence of disease is equivocal. The feeble entry of air into the lungs, caused by the obstruction of the larynx, produces great weakness of the breath-sounds, associated generally with a tracheal quality of respiration over the apices of the lungs, a condition which is very liable to be misinterpreted. In all such cases the examination of the sputum is most important, and often puts all doubt at rest.

J. S., aged sixty, was admitted to the hospital on account of dyspnœa. He had been ailing for six months, with cough, shortness of breath, and pain in the throat, but stated that he had not lost flesh. He presented marked inspiratory stridor and dyspnœa. Over the manubrium sterni there was tracheal breathing, faintly heard also at the apex of each lung. Breath-sounds everywhere weak.

Laryngoscopic examination revealed much swelling of the ary-epiglottic folds and a small pinkish growth on the internal aspect of the left arytenoid cartilage. Vocal cords fixed in the median position not more than one-sixteenth of an inch apart.

Diagnosis, laryngeal new growth with infected tracheal glands. Tubercle bacilli were found in the sputum next day, and the tubercular nature of the affection was thus settled. Increasing dyspnœa necessitated the performance of tracheotomy, which gave great temporary relief, but the patient gradually sank, and died five weeks later.

Post-mortem examination disclosed tuberculous ulceration and infiltration of the larynx, and a few small cavities and some fibro-caseous patches at the apices of both lungs.



## GROUP III.—CASES OF BRONCHITIS AND EMPHYSEMA.

In the absence of physical signs of apical consolidation, a diffuse bronchial catarrh, more particularly when associated with emphysema, may completely mask the existence of pulmonary tuberculosis. In all young adults with signs of emphysema and flat-shaped chests this possibility should be kept in mind.

Thomas H., aged twenty, coughed for seven years with asthmatic attacks. Clubbing of fingers. Hyper-resonance over both lungs with scattered rhonchi and general prolongation of expiratory sound.

The sputum contained a few tubercle bacilli. Some months later slight dulness and subcrepitant râles appeared at both apices, but four years later the patient was found to be in much the same condition.

## GROUP IV.—CASES WITH PHYSICAL SIGNS OF PLEURISY.

It is well known that pleurisy is frequently a manifestation of tuberculosis. In many cases of effusion this suspicion is excited without any physical evidence of phthisis being obtained. That so many cases of pleuritic effusion recover satisfactorily is no proof of their non-tubercular nature, for we know that complete absorption may ensue in the course of undoubted phthisis, and there is evidence to show that cases of pleurisy that have recovered were really associated with tuberculosis. This is not the place to enter into the fallacies of physical diagnosis as a gauge of the condition of the lung in cases of pleurisy, but it may be safely said that difficulties are often met with and the sputum in such circumstances may afford valuable assistance.

John E., aged seventeen, had suffered from cough and pain in the right side for six months. Physical examination showed signs of pleural effusion on the left side, extending up to the third rib. Tubercle bacilli were found in the sputum on several occasions, but always in small numbers. The effusion became absorbed and the patient improved. When he left the hospital the only morbid signs present were slight dulness and weak breath-sounds at the left base. Four months later he wrote to say that he was doing well and was about to resume his work.

## GROUP V.—CASES WITH PHYSICAL SIGNS OF DOUBTFUL IMPORT.

(a) ANOMALOUS SIGNS.—*Signs Simulating Localized Pneumonia.*—Thomas L., aged twenty-nine. Slight cough during the last fortnight, since “catching cold.”

Temperature 102° F. On physical examination a circumscribed patch of consolidation was discovered in the right axilla.

Diagnosis, localized pleuro-pneumonia. Scanty tubercle bacilli were found in the sputum several times. The physical signs gradually cleared up, slight dulness alone persisting. The patient improved and was lost sight of.

*Signs Simulating Aneurism.*—John L., aged thirty-four, fourteen months ago had a chill, which was followed by cough, pain in the right shoulder, dyspnoea, and several slight attacks of hæmoptysis. Physical signs: slight dulness, prolonged expiration, increased vocal resonance, and scanty subcrepitant râles in the first and second intercostal spaces on the right side close to the sternum, with distinct pulsation at the right edge of the sternum, but no tumor; over the area of pulsation, a short systolic murmur and a very loud aortic second sound; tracheal breathing over the manubrium; in the right axilla over the middle lobe, slight dulness and weak breath-sounds. The sputum was three times examined for tubercle bacilli and elastic tissue, with a negative result. At the fourth examination tubercle bacilli were found in fair numbers. The patient improved somewhat, but was soon lost sight of.

(b) APEX SIGNS OF DOUBTFUL NATURE.—Harriet P., aged twenty-two. No history of rheumatism. Ailing seven months with cough, expectoration, dyspnoea, and wasting. Physical signs: a systolic murmur in aortic and mitral regions, and a double murmur over the pulmonary area; resonance high pitched at apices of the lungs, with puerile breathing; crepitation at both bases. Tubercle bacilli were found in the sputum. Some weeks later crepitation became localized at the right supraspinous fossa, and subsequently signs of excavation appeared at both apices. The case became further complicated by the development of dry pleurisy, pericarditis, and albuminuria. Irregular pyrexia was present throughout. Death occurred four months after admission.

Post-mortem examination: Ulcerative endocarditis of both sides of the heart; a small old cavity at the right apex, and a few pea-sized cavities and small caseous nodules at the left apex.

(c) PHYSICAL SIGNS CONFINED TO OR MOST MARKED IN THE BASE.—Where signs of disease are present mainly or exclusively at the base of the lung, the diagnosis is often a matter of considerable difficulty. Chronic pneumonia or cirrhosis is the affection chiefly to be excluded, and the diagnosis is at times impossible until the sputum has been repeatedly examined. It is needless now to discuss the diag-



nosis of the various diseases which are apt to be localized at the base of the thorax; it must suffice merely to enumerate them: chronic pleurisy, whether in the stage of effusion or thickening; certain forms of mediastinal new growth; pulmonary abscess; hydatid cysts of the lung; hydatid cysts or abscess of the liver; subphrenic abscess; actinomycosis.

*Primary Tuberculosis of the Base of the Lung.*—John W., aged fifty. Five months ago he caught cold, had shivering fits, and was confined to bed for thirteen weeks with pain in the back and side, cough, expectoration, and loss of flesh. On admission respiration was very rapid, and temperature  $103^{\circ}$  F. Lungs generally hyper-resonant, with the exception of the posterior bases, where there was slight dulness. At the right base weak breath-sounds, with prolonged expiration and diminished vocal fremitus. At the left base tubular breathing and increased vocal resonance. Subcrepitant râles at both apices.

Tubercle bacilli in the sputum. At first their number was not great, but subsequently they were found in abundance.

The patient steadily went down-hill, signs of phthisis developed in the upper part of the lungs, and cavernous signs were detected at both bases.

Post-mortem examination: True tuberculous phthisis, originating at the bases of the lungs.

The cases narrated, though few in number, are fairly representative, and demonstrate the value of the sputum-test from a diagnostic point of view. It seems almost unnecessary at the present time to insist on the fact that tubercle bacilli are found only in the sputum of tuberculous cases. Numerous observations on non-tubercular affections of the lungs and air-passages have been made by the writer where the negative result could be checked by post-mortem examination. In no case have the tubercle bacilli been found during life in a patient in whom an autopsy showed the absence of tuberculosis of some portion of the respiratory tract.

It must be repeated that it is not claimed that the examination of the sputum can in any degree take the place of the ordinary methods of physical examination of the chest, which are infinitely more valuable. But the investigation of the sputum gives a certainty to our physical diagnosis in many doubtful cases, which cannot otherwise be attained.

The important subject of prognosis, unfortunately, has not been much elucidated by the clinical application of Koch's discovery. The number of bacilli found in the sputum is no index of the activity or

extent of the pulmonary disease, but, as stated in the paper before quoted, is "mainly a question of discharge." In many cases of quiescent disease the sputum persistently contains a large number of tubercle bacilli, whereas, on the other hand, in some acutely progressing forms of tuberculosis their number may be exceedingly small, at least for a time. When tubercle bacilli are evacuated in the expectoration, we may conclude that a bronchus communicates with a cavity or cavities, however small, or that tubercular ulceration of the main air-passages exists. It has been stated that, where tubercular ulceration of the larynx is present, the number of bacilli in the sputum is always considerable. This is certainly a mistake, as numerous observations have convinced us. It would be more correct to say that a large number of bacilli is a sign of excavation of the lung. Complete and permanent disappearance of these micro-organisms from the sputum is of course a favorable omen, but persistent expectoration of bacilli is not incompatible with practical arrest of the disease.

Let us now see what bearing the detection of the tubercle bacilli has on the treatment of phthisis. In the first place, it may be freely confessed that it has done a good deal of harm. Extravagant expectations were based on the method of antiseptic inhalation, which at the most could act on the bronchi and cavities freely communicating with them, and could not possibly influence the solid infiltrating tubercular growth. The introduction of sulphuretted hydrogen and carbonic-acid gas into the rectum need only be alluded to, and now possesses merely an historical interest. Bactericide remedies of various kinds have been administered by the mouth or hypodermically, without materially affecting the activity of the tubercle bacillus. Of the latest development, the injection of tuberculin, it is yet too early to speak with certainty. But, in spite of the disappointment occasioned by its comparative failure, we may hope that it is the starting-point of a new and more hopeful mode of treatment, based on an attempt to modify the soil on which the parasite finds the conditions necessary for its growth. Pathological anatomy is daily supplying proof of the cure or obsolescence of tubercular lesions of the lungs as well as of other organs, but it may be doubted whether clinical observers sufficiently appreciate this most important fact. How many pulmonary or bronchial attacks, after exciting our suspicions as to the presence of tuberculosis, are finally succeeded by complete recovery! In such circumstances it is the habit of many, perhaps of most, physicians to assume that, as the patient recovered, the diagnosis of phthisis was erroneous. Such an assumption is, no doubt, often correct, but there is good reason to be-



lieve that in some instances at least it is not justified. In the future it is probable that the complete cure of pulmonary tuberculosis will be a less rare observation, in proportion as physicians subject their doubtful cases in a routine way to the sputum test.

It may be asked what this has to do with treatment. All authorities are agreed as to the importance of early treatment, and, if we have in our hands a means of recognizing phthisis in its earliest development, obviously this method of diagnosis has a very considerable bearing on the question of treatment. Apart from the advantages of early recognition, our attitude in the treatment of the disease will be much more hopeful and energetic if we have been able to assure ourselves that recovery from pulmonary tuberculosis is a fact susceptible of clinical as well as anatomical demonstration. But it is to be expected that in many instances of recovery from suspicious pulmonary symptoms careful and repeated examination of the sputum will give negative results, for it is doubtful whether actual softening and excavation of the tubercular nodules commonly ensue in these cases, and, as was pointed out above, where no excavation takes place tubercle bacilli are not likely to be found in the sputum.

# TUBERCULAR PERITONITIS ; ITS NATURAL HISTORY, DIAGNOSIS, AND TREATMENT.

CLINICAL ARTICLE WRITTEN EXPRESSLY FOR THE INTERNATIONAL CLINICS.

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ONE of the commonest cases that comes under notice in the treatment of children is disease of the peritoneum that one supposes to be tubercular. There are four varieties of disease of the peritoneum met with in association with tubercle, which, although they may be more or less blended, are so often more prominently one or the other as to justify their distinction.

These are :

1. The matted condition of bowel associated with tubercular ulceration, and caseous disease of the mesenteric glands ; a disease that is called *tabes mesenterica*, and that has its well-known clinical features of tumid abdomen, pain, diarrhoea, wasting, and often fæcal fistula at the umbilicus,—a condition which needs no illustration, as it is too well known. A variety of this may, however, be mentioned, as not the most common, in which the glands only are affected, giving the physical signs of a fixed abdominal tumor.

2. Miliary tuberculosis of the peritoneum, associated generally with ascites, often with pyrexia and pain.

CASE I.—Emily H. (Case 17 in Table), aged five years, had been ailing some six months, and somewhat later dropsy appeared. There was no history of scarlet fever or throat-trouble. When seen in August, 1887, she was water-logged and orthopnoea was extreme. The



lower extremities were œdematous and brawny ; the abdomen measured thirty-two inches at the umbilicus, and was full of fluid. Both pleural cavities contained fluid. The face and eyelids were puffy. The urine was nearly solid with albumin. Cardiac hypertrophy could not be detected. The abdomen was tapped in the linea alba, and one gallon and two ounces of clear fluid, somewhat greenish in color, was withdrawn. The child died some hours afterwards collapsed.

At the necropsy two ounces of clear fluid were found in the pericardium. The left pleural cavity was half-full of fluid and the right a quarter so. Both lungs were œdematous, and the left lower lobe was collapsed. The abdomen contained a pint of fluid, and showed tubercular disease of the omentum, and, slightly, of the mesentery and intestines. The tubercles varied in size from that of a split-pea to a pin's head. Two tubercular ulcers of the size of a silver one-penny piece were found in the jejunum. The peritoneal coverings of the liver and spleen were studded with tubercles ; on section the organs were free from tubercular deposit. The kidneys were in the condition known as the large white kidney.

3. There is a condition of tubercular tumor, so to speak, in which a child is out of health, has griping pains at times, and a full stomach, in which, under examination, hard and fixed lumps are felt in one part and another of the abdomen, usually close under the parietes, but not always so.

All of these may be associated with tubercle in other organs ; but we should say that in our experience this is more often true of *tabes mesenterica*, that the miliary tuberculosis of the peritoneum may be associated with a like disease of the pleura, if of anything, and that the tubercular tumor—and it is with this group of cases we are here more particularly concerned—is for a long time local. We say that this variety of peritoneal tuberculosis is common, and we believe that it is well recognized as such by all clinical observers.

Nevertheless, it is not easy to find any detailed description of the condition other than is to be obtained by the perusal of the records of scattered cases.<sup>1</sup> The disease is due to the luxuriant growth of miliary tubercle in large mass. This will often occur in the omentum, which becomes much thickened and contracted into a thick band or plate,

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<sup>1</sup> While we were engaged upon this article a monograph appeared from the pen of Dr. Osler, of the Johns Hopkins University, which treats fully of cases of this kind, and is really the first adequate description that has been published. With much of that paper we entirely agree.

which stretches horizontally across the upper part of the abdomen. At other times a large mass or plate may form between the liver and the diaphragm (there, of course, it can hardly be recognizable); at others it may be in Douglas's pouch, where it can be recognized by rectal examination. Again, masses may be felt in any part of the abdominal cavity, and, when so, they are mostly intestinal coils matted together with tubercular deposit outside the bowel, a fact which explains a clinical feature that is often puzzling to those unacquainted with it,—viz., that the tumor, or tumors, are constantly varying in size and in definition. These cases have, in our experience, not often been associated with much ascites. In the course of the disease a certain amount of fluid may come and go, but the quantity is seldom great. The amount of febrile disturbance also is not great, and they linger on without marked alteration either way, and ultimately leave the hospital, probably better in general health, but not much different as regards the tumor.

Many such cases have come under our notice in the course of several years, and it has seldom happened that a child admitted for abdominal tumor of this kind has died in the hospital. The general impression we had gathered from our cases, as also that obtained from such literature as exists (which, however, is not large or precise in the actual record of cases in reference to this point), is that they ultimately recover. The present communication is intended chiefly as a contribution to the settlement of this question, and we may anticipate at once, to this extent, that the results of our investigations are hardly so favorable as our impressions had led us to expect they would be.

4. Cases which came under notice as abdominal abscesses but which ultimately proved to be of tubercular origin.

We propose first to address ourselves to the cases themselves, of some of which we give a short abstract and their subsequent history, and to tabulate the results of the whole number. We shall then discuss shortly the difficulty of diagnosis of these cases, and show that it is at any rate quite probable that some, if not many, cases that are looked upon as tubercular, may be simple inflammatory conditions or abscesses originating in the intestinal tract (the cæcal appendix, for instance) or other part of the abdominal cavity, unless verified by post-mortem examination, and that in consequence the percentage of cures of true tubercular disease may be less even than it appears to be, and, *per contra*, that inflammatory conditions and abscesses that look simple may yet be tubercular.



TABLE OF CASES.

NO. IN TEXT.	NO.	SEX.	AGE.	NATURE OF ABDOMINAL CONDITION.	RESULT.
II.	1	Boy.	5 years.	Peritonitis.—Tubercular.	Cure.
	2	Boy.	3 years.	Abdominal tumor.—Omental tubercle.	Alive two years after.
	3	Boy.	2½ years.	Abdominal tumor.—Matted intestine.(?)	Death.
III.	4	Boy.	2 years.	Abdominal tumor —Omental tubercle.	Death.
VIII.	5	Girl.	7 years.(?)	Abdominal tumor of tubercular nature.—Ascites, tapping.	Cure.
XIII.	6	Boy.	4 months.	Tubercular peritonitis. Omental tumor.—Bacilli.	Death.
XIX. VI.	7	Boy.	9½ months.	Tubercular peritonitis.	Death.
	8	Girl.	3 years.	Abdominal glandular disease.	Death.
	9	Boy.	21 months.	Tubercular tumor.	Death.
	10	Boy.	5 years.	Tubercular tumor.	Cure.
	11	Boy.	3 years.	Tubercular tumor of the peritoneum.	Cure.
V.	12	Boy.	7½ years.	Peritonitis.—Ascites.—Tubercular.(?)	Cure.
	13	Boy.	20 months.	Omental tubercle.	Death.
	14	Girl.	8 years.	Acute or chronic peritonitis.—Old phthisis.	Death.
VII.	15	Boy.	9¾ years.	Tubercular tumor of abdominal cavity.	Not known; going down hill when he left.
XVI.	16	Boy.	5 years.	Abdominal tubercle; lumps felt occasionally.	Not known.
I.	17	Girl.	5 years.	Peritoneal tubercle. — Large white kidney.	Death.
	18	Boy.	9 years.	Caseous epiphysitis of lower end of tibia.—Large white kidney.—Subacute or chronic peritonitis.	Death.
	19	Girl.	7 years.	Thickening of right Fallopian tube.—Tubercular lump, size of pigeon's egg, just above top of sacrum.	Not known.
IX.	20	Boy.	11 months.	Simple abscess simulating tubercular peritonitis.	Death.
	21	Boy.	3 years.	Ascites followed by abdominal tumor.	Not known, developed diphtheria.
XII.	22	Boy.	10 years.	Abdominal tumors. — Matted intestine and simply inflammatory.(?)	Cure.
IV.	23	Male.	28 years.	Omental tumor.—Subsequently tubercular peritonitis.	Death.
XI.	24	Boy.	17 years.	Ascites.—Subsequently ring at umbilicus and indurated cord running downward.	Recovery.
XVII.	25	Boy.	6 years.	Ascites followed by ill-defined lumpiness, and abscesses and suppurating caseous glands.	Death.

TABLE OF CASES.—*Continued.*

NO. IN TEXT.	NO.	SEX.	AGE.	NATURE OF ABDOMINAL CONDITION.	RESULT.
	26	Boy.	12 years.	Matted bowel and omentum. —Tubercular vesiculæ semi- nales.	Death.
X.	27	Girl.	12 years.	Abdominal tumor.—Simply in- flammatory.(?)	Recovery.
XX.	28	Girl.	2½ years.	Ascites.—Tubercular.(?)	Cure after operation.
	29	Boy.	3½ years.	Abdominal tumors.	Improving; no further attendance.
	30	Girl.	2 years.	Omental tumors.	Still attend- ing.
XIV.	31	Girl.	10 years.	Tubercular abscess.	Death.

OMENTAL TUMORS.

CASE II. (Case 2 in Table).—A boy, aged three years, had an uncle who died of consumption, and his mother succumbed to lung-disease after an illness of fourteen days. His illness dated back two months, since when he had suffered from severe diarrhoea with loss of flesh and night-sweats. The stomach had been distended, but was free from pain. When first seen, in August, 1888, he was quite happy and

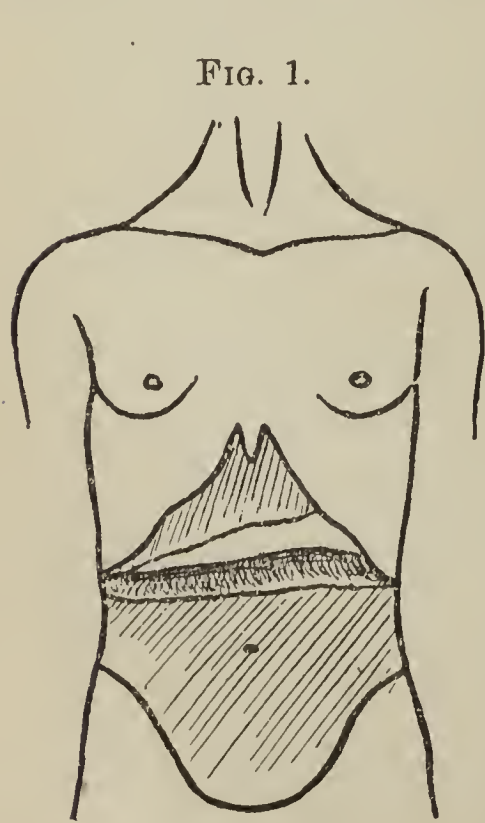


FIG. 1.

lively. His abdomen measured nineteen and a half inches at the umbilicus, was dull all over, with the exception of the epigastric region, and was doubtfully lumpy. Midway between the umbilicus and the xiphoid cartilage, and passing from the left costal margin, where it was hidden, obliquely to the right, below the free edge of the liver, was a sausage-like mass which ended in the right hypochondriac region. (See Fig. 1.) Temperature 99° F. He remained under observation for about a fortnight, when he was sent to a convalescent home. During this time he slept well and took his food satisfactorily. His temperature remained, for the most part, normal or a degree or so below that, the highest temperature recorded being 99.6° F. He was seen again some three months later, the abdominal condition being *in statu quo*. On this occasion he was under obser-



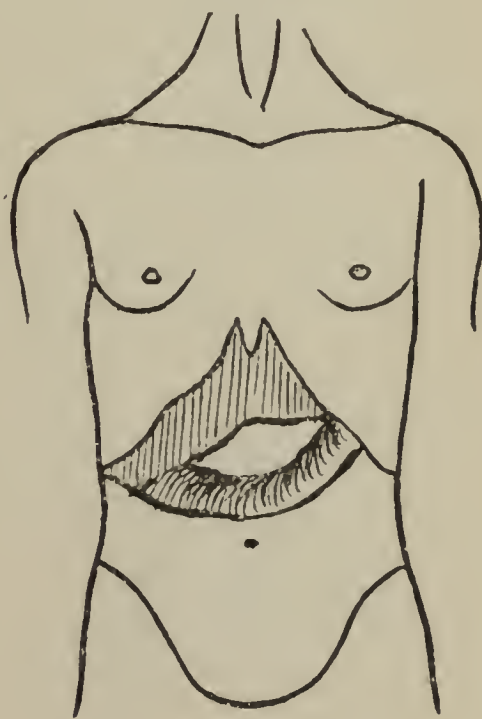
vation for about ten weeks, and during this time he lost slightly in weight. Whilst under our care the motions were formed, for the most part; sometimes they were loose, and varied from one to two in the twenty-four hours, very rarely more than that.

He was again seen two years later, when the omental tumor was much less in evidence, having shrunk considerably. Its position was lower down in the abdominal cavity, then lying underneath the umbilicus. He appeared a weakly child, and had several tubercular gummata, the size of Spanish nuts, on the outer side of the left thigh. These were treated surgically. His mother said he enjoyed fairly good health.

CASE III. (Case 4 in Table).—A boy, aged two years, began to ail six months previously, when he was thought to be suffering from “consumptive bowels.” Three months from the commencement of his indisposition his stomach began to swell, and varied in size from time to time.

When seen in May, 1886, he was fairly nourished and of pale complexion. His temperature was 99° F. The abdomen, which appeared distended, measured eighteen inches at the umbilical level. Starting from one costal margin to terminate, apparently, under the other was a tumor, which occupied the left and right hypochondriac regions, and also a portion of the umbilical and epigastric areas. (See Fig. 2.) Its upper border, in the mid-line, was one and a half inches from the lower margin of the liver, and curved, the convexity pointing downward to the left, disappearing under the liver, but to the right the liver could not be differentiated from it. The lower border of the liver could not be felt over it or in any way separated from it. The lower border of the tumor, in the mid-line, was just above the umbilicus. The tumor, of sausage-like shape and of considerable firmness, was easily felt below the abdominal parietes. To the right of the umbilicus it was somewhat monili-form. It could not be separated from the abdominal wall. The tumor was resonant in the left hypochondrium, but not elsewhere. On deep percussion this resonance disappeared. Some fine crepitations were detected in the lungs.

FIG. 2.

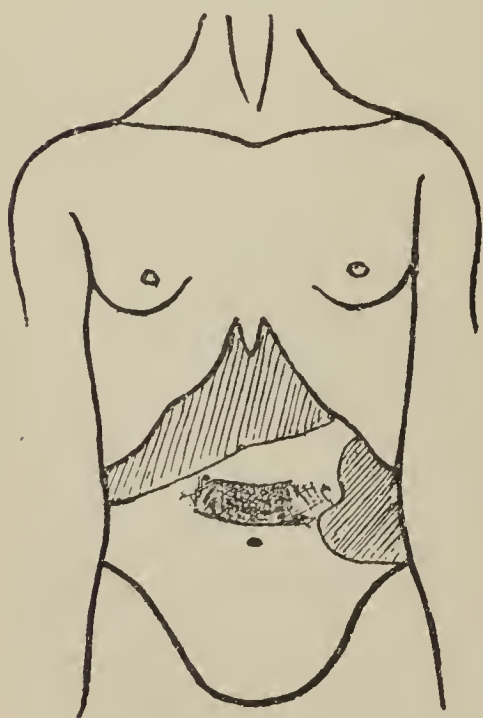


He was under observation for a few days only, and was lost sight of on account of an outbreak of scarlet fever. During this period he slept well and took his food well. The temperature was for the most part normal, the highest rise being  $101^{\circ}$  F. On an average he had four loose motions in the twenty-four hours. Some two months later he died, the doctor who attended him certifying death from consumption.

CASE IV. (Case 23 in Table).—A man, aged twenty-eight, with a history of pleurisy of some weeks' duration, was, as he was getting better, suddenly seized with severe abdominal pain, which was ultimately relieved by the accession of diarrhœa. This was followed by a paroxysmal pain whenever he took any food, but there was no vomiting. The diarrhœa ceased. He was much emaciated and phthisical-looking, but the lungs were apparently natural. The abdomen was not distended, but there was a lump above the umbilicus, under the left upper belly of the rectus, which was considered to be a caseous mass in the omentum or mesentery. He was subsequently in several of the metropolitan hospitals with pleurisy and then phthisis, and after a few months died of what was said to be tubercular peritonitis.

CASE V. (Case 13 in Table).—An extremely pallid boy, twenty months of age, came under observation in October, 1887, with the following history: He had jaundice three months prior, from which he never completely recovered, and about this time his abdomen commenced to swell. From then it had been increasing rapidly, and within the last three weeks it was generally large and tense. When examined there were both hepatic and splenic enlargement, and lumps were to be felt in other parts, though not defined, as the abdomen was too tense to localize them. An exception to this, however, was a lump just above the umbilicus, elongated in form, and running from above somewhat downward and outward

FIG. 3.



towards the edge of the spleen. (See Fig. 3.) The child had rises of temperature up to  $101.8^{\circ}$  F., and it varied from time to time between this point and  $97^{\circ}$ . On the whole he slept well, and took his food satisfactorily, but occasionally was fretful and wakeful. The motions were for the most part natural.



Five weeks later the abdomen was found to be bulging in the flanks, and there was a thrill. The tumor previously described—in the position of the transverse colon—shaded off on either side to indistinctness. The umbilicus was protuberant and translucent. He was much emaciated and of parchment-like color. He was sleeping well, and taking sufficient nourishment, but was sick from time to time. He had a cough, which had been troublesome, on and off, but was now better. He suffered from slight, occasional, general sweats. The motions were still natural. His condition remained about the same until his death, a fortnight later. Towards the end the bowels were looser, and he finally died from exhaustion.

*Necropsy.*—Much emaciation. Distention of the abdomen. Purpuric spots were found at the folds of the elbows, knees, and fronts of the legs. The right lung was œdematous, the left the same, with some scattered broncho-pneumonic patches. The omentum was adherent to the abdominal wall, and there was an enlargement running from it towards the spleen. The liver showed perihepatitis, and tubercles were scattered sparsely throughout its substance. The spleen was much enlarged (it weighed nine and a half ounces) and had an adherent thickened capsule; on section several tubercles were seen. The mesenteric glands were enlarged, several of them being far advanced in caseation. The intestines showed three tubercular ulcers and three swollen Peyer's patches, all in the ileum at varying distances from the valve.

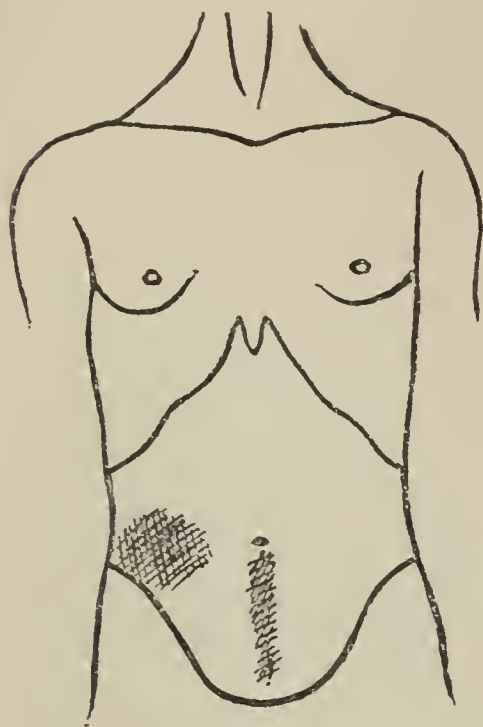
ILLUSTRATIONS BY CASES IN WHICH THE DISEASE TOOK THE  
FORM OF FIXED ABDOMINAL TUMOR OTHER THAN  
THAT OF OMENTAL INFILTRATION.

CASE VI. (Case 9 in Table).—A boy, aged twenty-one months, was first seen in June, 1889. He was brought for swelling of the stomach, wasting, and constipation. The abdominal swelling had been noticed three weeks, and varied from time to time, but he had been ailing some time previously to this. The intestinal rumblings were very distressing; he could not sleep, and passed scarcely any urine. The bowels were confined for three or four days, and then acted loosely.

He was found to be a fairly-nourished, irritable, and rachitic child, with an enlarged abdomen, which measured twenty-three and a half inches at the umbilicus and twenty-four and a half inches at the widest part. It was distended, tympanitic, and the abdominal veins were large. Per rectum there was doubtful lumpiness in the right iliac region, and over the last lumbar vertebra two enlarged mesenteric glands

were detected. A few days later there was no doubt about the lump in the right iliac region, the abdominal distention having decreased. (See Fig. 4.) In the hypogastric region a cord-like mass, of about the diameter of a cedar-wood pencil, was detected over the site of the

FIG. 4.



urachus. Per rectum a very distinct mass, slightly irregular in outline, was found, situated just above the last lumbar vertebra; and between the examining finger and the abdominal wall several inches of hard tumor were felt. A week later lumpiness was detected to the left of the umbilicus. Lately he had suffered from frequent abdominal pains, and the motions had been loose and dark green in color.

The child died soon after, and a necropsy was made, which verified the diagnosis. The tumors were due to matted intestine. A more extended examination was not made, as the body was far advanced in decomposition.

CASE VII. (Case 15 in Table).—A boy, aged ten years, had always been a healthy lad until one week previously to his coming under observation, in November, 1885. There was a history of consumption in the family. On leaving a restaurant his abdomen was found to be blown out, and the child himself called attention to this condition. Since then it had increased in size. There was a history of feverishness, irregularity of the bowels, and inclination to constipation. At first pain was complained of on either side of the abdomen; latterly it was located at the umbilicus. He was found to be a thin, pale-faced child, with a temperature of 100° F.

The abdomen showed large blue veins coursing over the parietes; it measured twenty-four inches at the umbilicus and was tender to the touch in the right iliac fossa. There was some fluid. The submaxillary glands were much enlarged. A week later the spleen was made out to be anterior to the costal margin. The abdomen was much distended, the intestinal coils being seen through the abdominal wall. A fortnight after admission a hard lump was detected on the left side of the abdomen; above it was lost under the costal arch, below it reached to the level of the anterior superior spine, and in front disappeared under the rectus. (See Fig. 5.) In the right ilio-hypogastric region there was also an ill-defined lump. The temperature was maintained



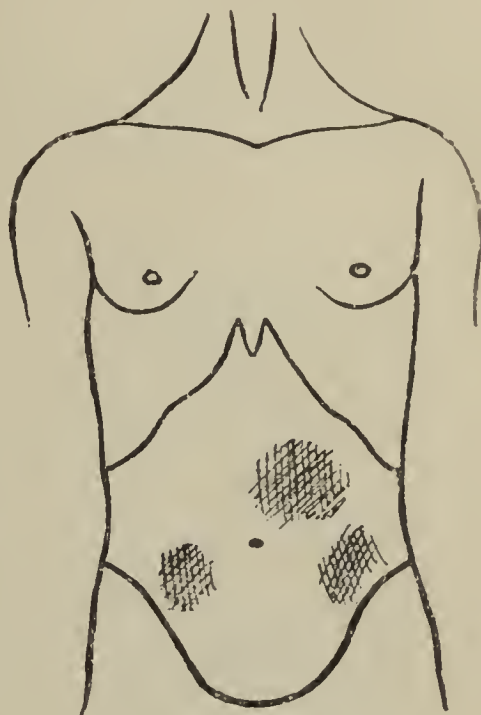
between  $98^{\circ}$  and  $96^{\circ}$  F., the highest point being  $98^{\circ}$ , which occurred once.

Six weeks from the date of admission the lump in the left side ended downward by a rounded margin and was on a level with the anterior superior spine. Inward it was on a level with the external border of the rectus. Both margins were thickened. Behind it was traced to within a level of one inch of the free border of the eleventh rib, and then disappeared in an ill-defined way. The surface was smooth, the tumor being slightly movable. On its lower margin, a distance of two and a quarter inches upward, there was a horizontal groove, and from this point the lump lost its smooth surface, was not so definite, and was apparently situated deeper down. It disappeared under the rectus to the right, and above was lost under the costal margin, as also to the left. At about one inch below the level of the right anterior superior spine, just outside the external margin of the rectus, a nipple-like projection was traced into an ill-defined lumpiness stretching one and a quarter inches above this point, with its lower margin curved semicircularly, the convexity downward, being parallel to the direction of Poupart's ligament. Tympanitic resonance was obtained over the ill-defined portion of the tumor on the left side, but not so over the other part. The communication between the tumors on the right and left side could be detected. At about this time he was gaining slightly in weight. A month later he was losing flesh. The temperature ranged a little above or below  $99^{\circ}$  F., but on one occasion it was  $101.2^{\circ}$  and on another  $102.8^{\circ}$ . The bowels acted fairly regularly, and he was bright and cheerful, but beginning to look wizen-faced. He had an earthy-looking skin. He was sleeping well and taking his food satisfactorily.

A little over four months from the time of his admission he was removed by his parents. Within a few days of his removal his temperature had been running higher,—viz., to  $101.6^{\circ}$ ,  $102^{\circ}$ , and  $103^{\circ}$  F. His subsequent history could not be ascertained, but there could be little doubt that he died before long.

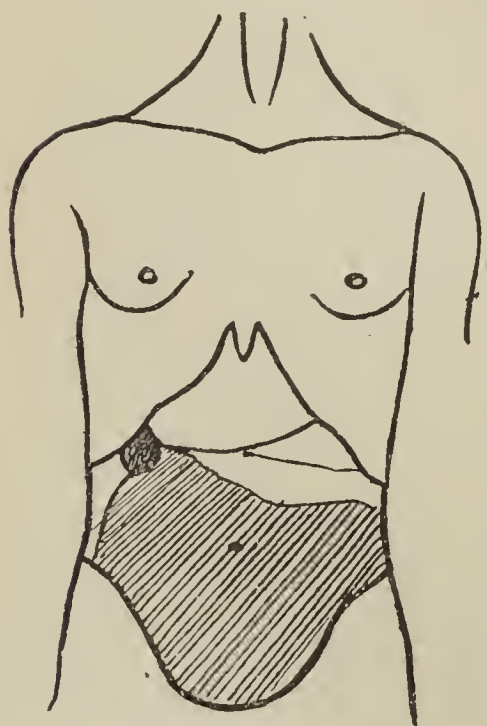
CASE VIII. (Case 5 in Table).—A girl of seven years dated her illness from an attack of chicken-pox six weeks previously, and a fort-

FIG. 5.



night later her mother noticed a painless swelling of the abdomen, varying in size from time to time. She was not sick, but suffered from nausea. When seen in November, 1887, she was found to be a dark-complexioned child, and did not appear to be ill. The abdomen was dull to percussion, with the exception of the stomach region and that over the ascending colon and the left half of the transverse colon. The flanks were bulged, but resonant. The whole abdomen was manipulable *en masse*, and it measured twenty-six and a quarter inches across the umbilicus. At the level of the right costal cartilage a half inch below the costal margin was a tumor about the size of a walnut (see Fig. 6), which was very probably the gall-bladder. As regards

FIG. 6.



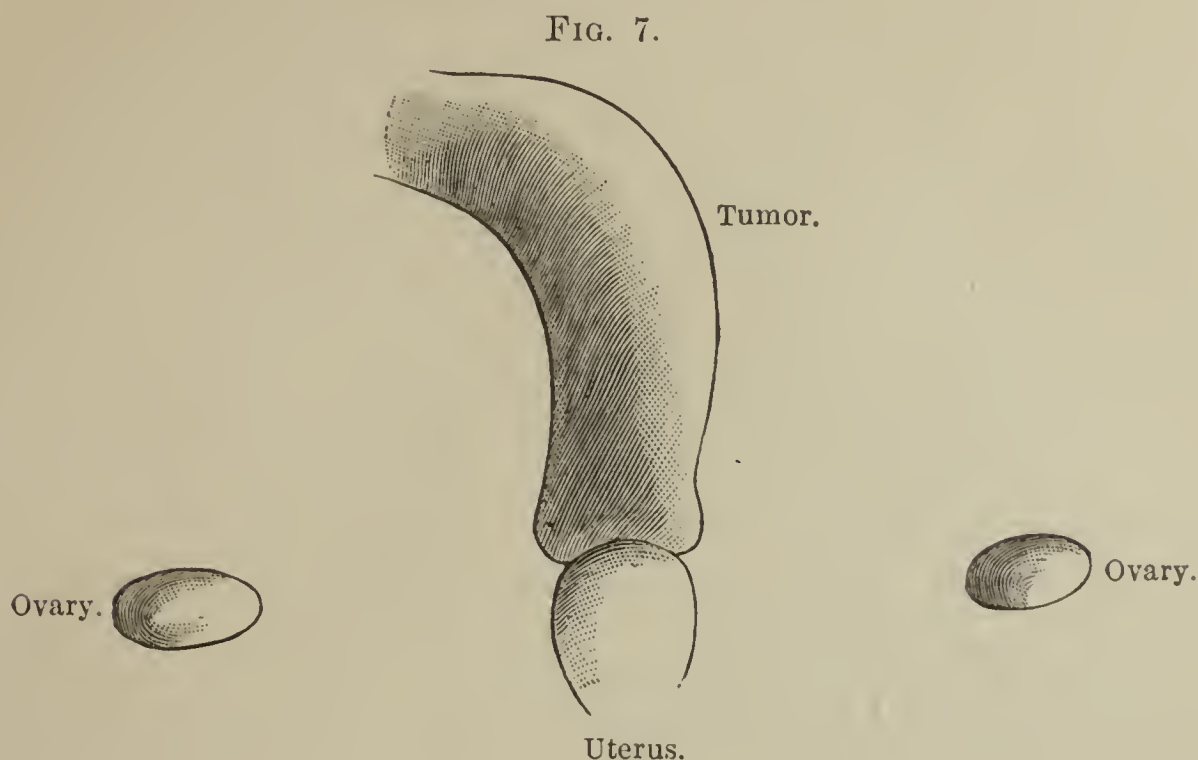
the lungs, the chest was dull from just below the angles of the scapulæ, and this was associated with distant vesicular breathing. A fortnight later she complained of abdominal pain, for the first time, and about three weeks from that date her abdomen measured thirty and one-eighth inches midway between the xiphoid cartilage and the umbilicus. To percussion it was of fluid dulness, with the exception of a little resonance to the extreme left flank and over the stomach, and there was a marked fluid thrill. Her temperature did not rise above 99° F., and she was well in other respects. A few days later she was tapped, on either side of the abdomen, with Southey's trocar,

seven pints of clear fluid being evacuated. The abdomen then measured twenty and a half inches at the umbilicus. In the centre a lump was detected about on a level with the transverse colon, and the free edge of the liver was felt a finger's breadth below the costal margin. Everything progressed satisfactorily, with the exception of occasional rises of temperature (99° F.), and she was discharged on February 27, 1887. Whilst under observation she was constipated.

In July, 1888, she was again seen. She had maintained her satisfactory condition, and her abdomen measured twenty-one and three-fourths inches. A rectal examination showed that from the top of the uterus, which was apparently unaffected, a rounded tumor arose which was of the thickness of the index finger. (See Fig. 7.) Passing vertically upward it then curled to the right in a semicircular manner. It

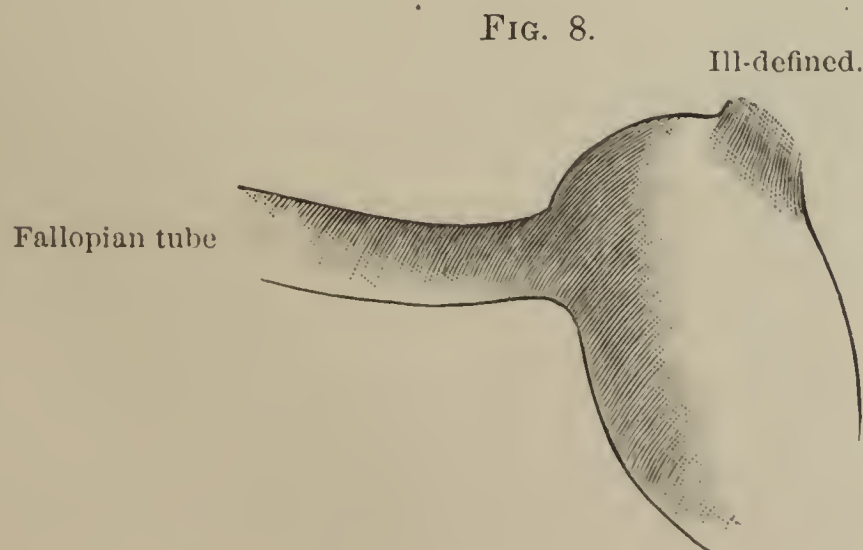


was about three inches in length, and was lost in its upward course in the abdominal cavity. On either side of the uterus the ovaries could be distinguished; they were healthy.



This patient was again examined in May, 1890, and then appeared in robust health. Per rectum the tumor previously described was still there, but it was then about the thickness of a lead-pencil, and had evidently shrunk considerably. Physical examination otherwise gave negative results.

In this connection the condition found in Case 19 in the Table is interesting. (See Fig. 8.)



Coming now to our next heading, where simple abscesses simulate tubercular disease of the abdomen and *vice versa*, we shall first give instances of simple inflammatory conditions.

## SIMPLE INFLAMMATIONS OF THE PERITONEUM.

CASE IX. (Case 20 in Table).—A male infant, aged eleven months, attended in July, 1890, with the following history: He had suffered for fourteen days from severe abdominal paroxysmal pains accompanied by nausea and vomiting. He had lost flesh. There was a remote history of consumption on the maternal side. He was breast-fed, supplemented by cow's milk, bread, etc. When seen he was pale but fairly nourished. The abdomen was distended and prominent. Around the umbilicus was a well-marked local projection which was reddened, tender to the touch, and considerably indurated. There was dulness in the left umbilical, hypochondriac, iliac, and lumbar regions, but no fluid thrill. He was rickety, but otherwise nothing abnormal was detected. Temperature 99.4° F. The following week there was no material change, though, if anything, the abdomen was not quite so swollen. The act of defecation made him scream. A fortnight from his first appearance a small quantity of matter was noted by his mother about the navel, followed in two or three days' time by a fæcal fistula. He was then admitted under Dr. Frederick Taylor. At this time his face was of a gray color and cold, as were also the extremities. The pulse was frequent and feeble; the respiration hurried. He cried out occasionally as if in pain, and was very restless. Large, loose, yellowish motions mixed with pus were passed through the wound. A week later a pad was applied on either side of the fistula, to promote its closure if possible. Later on the child became much collapsed, and the abdomen was swollen and tympanitic. The removal of the pad was followed by a rapid rush of gas and fæces. He died the same evening.

*Necropsy.*—On opening the abdomen a large abscess-cavity was seen, measuring four inches by two inches, mostly situated to the left of the umbilicus and stretching across the middle line to the right iliac fossa. This was filled with yellow semi-solid fæcal material, on the removal of which a grayish wall was visible, covered with flakes of shreddy lymph. Beneath this lay many coils of intestine, not matted together. On slitting up the intestines the mucous membrane immediately surrounding the fistula, which was in the upper part of the ileum, was found to be perfectly healthy, as were other portions of the bowel.

The inference, therefore, is that the abscess opened *into* the bowel, and not that it originated in an intestinal perforation. The other organs were healthy.



CASE X. (Case 27 in Table).—A girl of twelve years, of fairly healthy family, was taken, a few weeks before she came under observation, with sudden pains in the abdomen, peritonitis, and the appearance of a large tumor in the lower part of the abdomen. She was very ill for some time, and when seen had a large, doughy, inelastic swelling in the median line below the umbilicus, which extended nearly up to it and well into the inguinal regions on each side. The umbilicus was distended and red. The girl was much emaciated, but, with the exception of the tumor, nothing could be detected save a little questionable crackling at the left apex. The question was, Was the tumor simply inflammatory or was it of a tubercular nature? The sudden onset suggested an inflammatory origin, and possibly an abscess. She was treated by the inunction of mercurial ointment, and cod-liver oil was given internally; no abscess ever formed; she quite recovered, and remains well.

CASE XI. (Case 24 in Table).—A youth of seventeen years, with a delicate mother, and who had never been other than a poor, delicate boy, had a few years previously a curious brain attack, with squint, which made his medical man think him tubercular. However, he got well of this. He always had a protruding stomach, so that the boys at school called him "Pot." Two days before Bank-holiday his bowels became irregular, and he therefore took a Seidlitz powder, but this made things worse rather than better. He nevertheless went for a long tricycle ride, and after this became seriously ill, and he was then found to have ascites. He was a tall, dark, delicate-looking fellow, with a questionable right apex. The abdomen contained a moderate quantity of fluid, was very tender in places, particularly in the iliac regions. There was a hard ring at the umbilicus, and an indurated cord running downward which we thought must be tubercular. He had a little pyrexia at times,—nothing much. At the end of a fortnight he was free from pain, and the fluid nearly gone. He ultimately got quite well, and has so remained now five or six years.

CASE XII. (Case 22 in Table).—A boy, aged ten years, had for a long time complained of pain in his right side. He had influenza in January, 1890, and since then had had pains all over the lower part of the body, and swelling of the abdomen, with some vomiting. He was admitted into one of the Children's Hospitals and rapidly got better, but after three or four weeks was again as bad, or worse. He was seen in March, 1890. He then looked wretchedly ill, pinched and emaciated, the abdomen being much swollen, and the lower segment dull throughout, but without any definite thrill. The history and

aspect led to the conclusion that the case was one of tubercular peritonitis, and he was admitted to Guy's Hospital. Within a day or two of his admission the state of the abdomen had quite altered: the part that had been dull had become quite resonant, and now ill-defined, but quite definite, lumps were felt in various parts. No additional knowledge was gained from rectal examination. He was in the hospital some four or five weeks, the lumps being sometimes palpable, sometimes not. The bowels acted regularly by means of enemata or naturally, and he improved much in health. He was again seen five months later, when he was still complaining of abdominal pain which prevented his running about, but his bowels were acting regularly and he looked in fair health. There were still two well-marked lumps to be felt, one on either side of the abdomen, below the umbilicus, in the region in which they had been felt at first. Within the last few weeks he has again been seen, and nothing abnormal could then be detected in the abdomen.

On the other hand, cases are met with which at the inspection do not appear tubercular, but simple rather, yet a microscopical examination reveals their nature.

#### TUBERCULAR INFLAMMATION OF THE PERITONEUM WHICH, ON INSPECTION, APPEARS SIMPLE.

CASE XIII. (Case 6 in Table).—A male infant, aged four months, was brought for advice in February, 1890, for a large abdomen and fretfulness. He was fed on cow's milk and water. The bowels were opened three or four times daily. The mother had had eight miscarriages, and all her children were born with snuffles. When seen his abdomen was found to be very tense and enlarged, blue veins coursed over its surface, and he screamed when it was touched. Nothing definite was detected in the abdominal cavity. He had craniotabes and snuffles. He died a month later. Whilst under observation the abdomen increased in size and he emaciated considerably. The bowels were of natural color. Flatulence was troublesome. A fortnight before his death he developed broncho-pneumonia. Four days before death he was much sunken about the eyes and the anterior fontanel was depressed, and on the day before death he became convulsed and was very restless and moaned continuously.

The necropsy showed broncho-pneumonia. The great omentum was tightly bound down to the intestines; it was greatly thickened by lymph and granular on the surface. The whole of the intestines were matted together by thick, tough lymph, of a yellowish-gray color,



from which the gut could be drawn, leaving a clear shining surface. The mesenteric glands were not enlarged. There were no tubercular ulcers or swellings of the intestinal follicles, but the inner surface of the gut was studded with minute hemorrhages scattered here and there; they were not numerous. The liver was large and marked by the ribs, pale and fatty both macroscopically and microscopically. The surface was adherent to the diaphragm. The spleen was small, the capsule thickened and adherent to the surrounding structures. Microscopically the thickened capsule was seen to be of a tubercular nature, and the peritoneal lymph was made up of tubercles, for the most part caseating, and it was crowded with tubercle bacilli.

#### ABDOMINAL ABSCESES.

CASE XIV. (Case 31 in Table).—A girl, aged ten years, had always been healthy until the present illness, which dated back four weeks. No history of consumption in the family. After playing with her sisters she suddenly complained of "slight pain in the bowels," turned pale, and had to lie down. In the evening she was taken sick, and diarrhœa appeared simultaneously. From that time she kept to her bed, had an evening temperature of 102° F. or thereabouts, and was apathetic. The diarrhœa soon ceased, and pain was not complained of. Ten days before she was seen she began to lose flesh rapidly, vomited from time to time, her abdomen became swollen, and there was general tenderness on pressure. Her tongue was dry, and the lips were dry and cracked. Her bowels were confined, the stools being formed and dark in color. On February 4, 1891, Dr. George Carpenter saw the child with Dr. Frederick Nicholls, of Croydon, who told him that for some time he was in doubt as to whether her condition was due to typhoid fever or occasioned by abdominal tubercular disease baffling detection. Her condition was as follows: She was much emaciated, apathetic, and with an abdominal expression. The tongue was moist but furred, and aphthous patches were seen in the mouth. Temperature 99° F. The heart's apex was displaced upward and inward just below and to the right of the nipple. The left chest gave evidence of fluid in the pleural cavity, reaching as far as the angle of the scapula behind and the nipple in front, and which merged into abdominal dulness. This abdominal dulness was wellnigh absolute all over. In the right flank there was resonance, but in the left this was not nearly so marked. This resonance did not shift with change of posture. A well-marked fluid thrill could be transmitted from the abdominal to the pleural cavity and *vice versa*, but this was absent in the extreme

flanks. Per rectum no lumps were felt and the iliac fossæ were free. Bimanual palpation showed a deep fluctuating tumor between the finger in the rectum and the abdominal wall. The liver and spleen were not enlarged. The urine having been drawn off, an exploratory puncture was made in the middle line and pus was withdrawn. The following day she was seen by Mr. Clement Lucas, who removed thirty ounces of thick yellow pus. Some small indurated masses were felt on the intestines, which were of doubtful nature. No bacilli were detected in the pus (Heneage Gibbs's method).

So far as the surgical portion of the case is concerned she progressed quite satisfactorily, but her temperature, on occasions, was over 100° F. and even up to 103° F. During this time she had a sore throat and then purulent otitis media. On the nineteenth day after the operation she became unconscious and died within a few hours.

At the necropsy some opacity was found on the upper surface of the brain, and slightly so over the pons. There was a suspicious-looking nodule on one posterior cerebral artery. In the left chest a localized empyema was found at the left base, containing about eleven ounces of pus. No communication with the abdominal cavity could be made out. Tubercles were scattered through the left upper lobe of the lung, and the lower lobe was solid in a condition of red hepatization. The abdominal abscess-cavity was completely shut off, a thick wall extending into the true pelvis, and upward and to the left as high as the umbilicus, in front of the intestines. The cavity had been completely drained. Scattered over the outer wall of the small intestine were yellowish-white nodules of about the size of a split pea. Peyer's patches were enlarged and congested. The mesenteric glands were enlarged, and some caseating,—one contained half a drachm of pus.

#### DIAGNOSIS.

Next a word or two on the question of diagnosis, and first as to the importance of *rectal examination*. Not only can the whole of the pelvic cavity and the lower lumbar vertebra and glands be explored by the finger and the presence or absence of implication of the uterine appendages detected,—and, in parenthesis, we may mention that we have seen tubercular salpingitis in a child of two years,—but by bimanual manipulation any lumps in the abdominal cavity below the level of the umbilicus can be carefully explored, and a very correct estimate obtained of the quantity of thickened material between the finger in the rectum and the abdominal wall. It may even be said that in babies the degree of separation of the fingers often does not



exceed that of the thickness of the abdominal wall; but when intestinal adhesions are present the obvious increase of tissue will be detected, an increase which cannot be gauged by external palpation merely, though even with it the observer may notice the intestines move *en masse*, rather than slip away from the hand of the examiner as in a state of health.

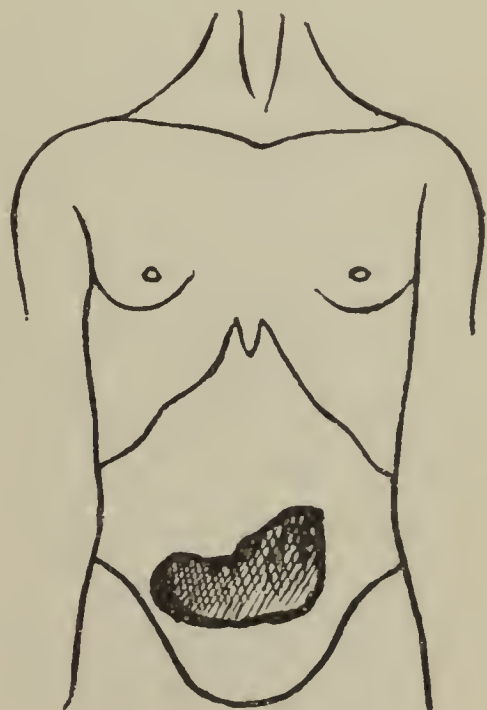
Before such an examination is undertaken an enema should be given, and the bowel cleared of its contents, which are not unfrequently scybala in these cases.

Abdominal tumors thought to be due to organic changes may then disappear. But it must always be remembered that the bladder lies high in children, and that when distended it may nearly resemble an abdominal cyst. Before examination, therefore, the bladder must be emptied as well as the rectum.

CASE XV.—A girl, aged three years, who had been nursed for ten months and subsequently fed on cow's milk, beef-tea, and farinaceous foods, attended, in April, 1889, for abdominal pains, diarrhoea, wasting, and a large stomach. She had a "blobby" abdomen, and was somewhat rachitic and wasted. The child was carefully dieted, and a bismuth-and-soda mixture ordered, which was subsequently altered; but, in spite of various remedies, the diarrhoea continued more or less, abdominal pains remained, and she lost weight. On the forty-ninth day she was more emaciated than ever, and she had been sick for a day or two.

The abdomen was resonant all over, but a decided lump was felt in the abdominal cavity opposite the umbilicus. By rectal examination there was found a large tumor (Fig. 9) in front of the spine, which felt grapy, and a lump the size of a walnut was detected in the left side. Under treatment (subcutaneous injections of one-thirtieth of a grain of perchloride of mercury) she made decided improvement, and some hope was entertained of her ultimate recovery, but about six weeks later the abdominal lumpiness had increased, invaded the lumbar region, and the hypogastric also to a less extent. The abdominal measurements were, however, less. Diarrhoea was again a troublesome feature of the case, but, in spite of these

FIG. 9.



drawbacks, her weight had increased somewhat. In a month from this time the lumpiness on the right side of the umbilicus was very distinct to the touch, and somewhat lobulated, and the umbilicus was bound down to it. It was smaller, however, and that on the left was farther away and not so defined. Diarrhœa was troublesome still, and she was very pale and fragile-looking. The total loss of weight during treatment was fourteen ounces. Her abdominal measurement had decreased by one and three-fourths inches. She was not seen again, and most probably succumbed to the malady.

CASE XVI. (Case 16 in Table).—A boy, aged five years, began to waste in March, 1888, and about that time abdominal enlargement made its appearance. There had been shortness of breath, pain on defecation, and the motions were regular, light colored, and offensive. When seen in May he was pale and wasted, with an anxious expression of face. Temperature 98° F. The abdomen was hyperresonant, with deficient resonance in the left flank in all positions. A few days after, there was some dulness in the right iliac region. A rectal examination revealed a tumor in the hypogastric and right and left iliac regions, more marked in the latter. This consisted of several distinct lumps, some larger than others, and all more or less rounded at the lower part. Upward they could not be traced. The abdomen was resistant and felt like blown-out intestines. His bowels were confined. Some two and a half months later he was decidedly better. During the interval his temperature had been slightly raised (99° F.), and on one occasion it had risen to 103.2° F. The abdomen was now softer, and he was gaining weight. A few weeks later he was sent to a convalescent home, the temperature still being slightly above normal. When seen again, in the autumn, he was still gaining in weight. On November 25 he was again sent to a convalescent home, having lost two ounces in weight during the interval. His condition then was much as before. The parents having moved, no subsequent account could be obtained.

Next as to the variations that are sometimes noticed in the characters and behavior of the abdominal contents, which are well illustrated by the following cases :

CASE XVII. (Case 25 in Table).—A boy of six years, of an exceedingly healthy family in all respects, suddenly began to fail in appetite and get thin. At the same time his abdomen was noticed to be getting larger, and ascites soon developed to a moderate extent. Within three weeks of the commencement of his illness some ill-defined lumps were felt in the epigastric region, and also midway between



the umbilicus and eighth costal cartilage on the splenic side. He was free from all pain. Rectal examination revealed nothing. He gradually failed, and died three and a half months later. During the course of his illness his temperature was nearly always high at night, towards the end very high (104° F.). He had a good deal of diarrhoea, the stools being dark brown, and he had always much distention; but the swelling had this peculiarity about it,—that, whereas sometimes it would appear to be due to a large quantity of fluid, at others it equally surely gave evidence of being chiefly gas. On one occasion so certain were Mr. Sams and Mr. Stokes, of Blackheath, who attended him, that there was fluid in quantity that they went to the house with the intention of tapping the abdomen, and when they arrived the conditions had so altered that the operation was postponed. The same thing had happened on a previous occasion in this boy, so that he was sent to Dr. Goodhart as a case of ascites, but when under examination it was impossible to be sure of the presence of fluid. Mr. Sams and Mr. Stokes made an inspection of the body after death. In the pelvis everything was one purulent mass. A large abscess opened into the colon, with no recognizable landmarks. Another large abscess was underneath the liver, at the back of the stomach, and numerous small suppurating caseous glands were scattered about. The organs were otherwise healthy.

Now, it is not uncommon in cases of like kind for variations, such as were here noticed, to succeed each other quickly, and it is therefore worth while to lay stress upon the characters presented by the abdomen, and the difficulties in the way of determining the exact nature of the case, and even the best way of treating it. As has been said, sometimes there was evidently a considerable quantity of fluid in the peritoneum, sometimes the quantity had apparently rapidly decreased, and once, although shortly before there had been no doubt about it, there was no certainty that any quantity was present. A very similar clinical picture has come before us at other times, and in one other case at least one of us has had an opportunity of making an inspection. Some years ago Dr. Goodhart saw, with Dr. Prance and Dr. Herbert Evans, of Hampstead, a gentleman between fifty and sixty years of age, in whom at one time it appeared certain that a large collection of fluid could be detected in the left side of the abdomen, and at another it was just as uncertain,—dulness had become converted into resonance, and all definition of a tumor or cyst had become obliterated. Mr. Davies Colley saw the case and thought he could detect fluctuation, and a trocar was passed into the supposed swelling, but without result. The

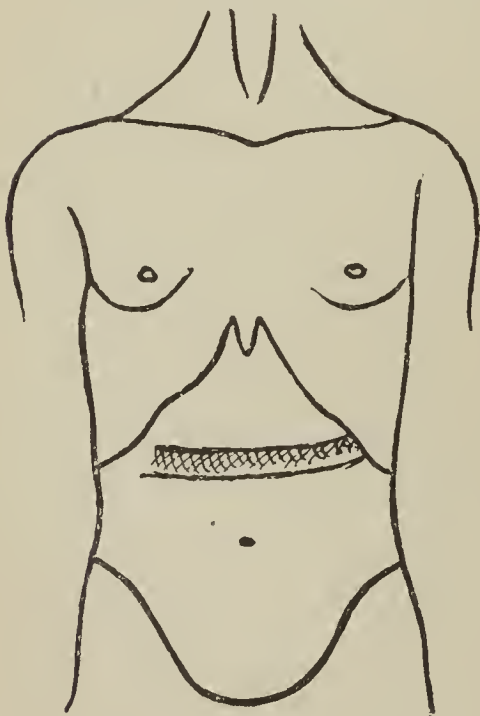
patient died a few days afterwards, and a large abscess, freely communicating with the colon, was found among the coils of intestine on the left side of the abdomen. It may be asserted from these two inspections, which is indeed most reasonable and likely, that when fluid seems to be present in the abdomen at one time and not at another quickly ensuing, and this variability is noticed on several occasions, the probability is that fluid is present, but that the fluid, instead of being definitely encysted in one particular locality, or free in the peritoneal cavity, is encysted among the intestinal coils, and that as these alter in position and in distention so the evidences of the fluid alter, and either disappear and reappear, or in some way vary from being very manifest to being altogether indistinct.

The difficulty that exists in differentiating tubercular conditions from other abdominal diseases is well illustrated by another case that has occurred to us, where an intussusception suggested the existence of omental tumor.

CASE XVIII.—A boy, aged fourteen and a half years, whom we saw in January, 1891, had been suddenly seized with pain in the abdo-

men seventeen days previously. There was some doubt as to whether this had not been occasioned by his eating a holly-berry. For seven days and nights he had suffered from continuous pain, accompanied by vomiting. On the third day of his illness his bowels were opened, and he was said to have passed a pint of dark blood from the rectum, and blood appeared in the stools for two succeeding days, but none since then. His bowels had been opened once a day until within two days of his being seen. He was losing flesh very rapidly. When examined he was found to be a pale, emaciated child, evidently ill. The abdominal walls were

FIG. 10.



perfectly manipulable. About two fingers' breadth above the umbilicus was felt a resistant sausage-shaped body extending transversely across the abdomen, a trifle tender on pressure. (See Fig. 10.) It was continued farther towards the left than the right side, and had an upward curve leading it under the left costal margin. There was no abdominal distention whatever. A simple soap enema was administered, which brought away formed fæcal masses but no



blood. Rectal examination failed to discover anything abnormal. His organs were healthy. For a fortnight he passed natural motions and was for the most part free from pain. The tumor was not so hard or so distinctly rounded. He was emaciating. Subsequently for another fortnight he was sick a few times and the abdominal pains were a variable feature. His bowels acted regularly after enemata. In two or three days' time from this, however, acute abdominal symptoms supervened, and laparotomy was performed by Mr. G. H. Makins. An intussusception was found and reduced, but he died in a few hours. The mesenteric glands were enlarged, but no tubercles were detected. Intussusception was suspected at the time this case was under observation, from the presence of the blood in the stools, but was negatived on the following grounds: 1. The apparent illness of the child. 2. The emaciation. 3. The flaccidity of the abdomen. 4. The passage of formed fæces. 5. The situation of the tumor, and the absence in it of contractions, which were carefully searched for.

A rare form of malformation, the horseshoe kidney, may be mistaken for abdominal tuberculosis.

Such was the case in a child of two years, seen in January, 1889, who was suffering from whooping-cough complicated by broncho-pneumonia. Dr. Carpenter made a rectal examination in this case, and by this means was enabled to map out, aided by bimanual manipulation, the outlines of what was thought must be a horseshoe kidney. The child was sent into the wards, but here this diagnosis was considered somewhat fanciful, and the child was thought to be suffering from general tuberculosis and tabes mesenterica. The child succumbed to the ailment in a few days, and the necropsy proved the original diagnosis to be the correct one. We quote the case not only as illustrating this point, but for the purpose also of supporting our contention of the extreme value of rectal examination. Had it not been for this routine practice, in the above case the diagnosis would not have been made.

One other point that has seemed to us not infrequent is the difficulty of differentiating typhoid fever from abdominal tuberculosis, and instances have occurred to us—as they have, we imagine, to most physicians—where cases supposed at their onset to be the one have eventually assumed the features of the other. It is, of course, generally allowed that typhoid fever does occasionally render the patient liable to abdominal tuberculosis; but there is another reading, at any rate for some of these cases,—viz., that what was supposed to be typhoid fever was really from its commencement a tubercular fever, and we are inclined to suspect that a mistake of this kind is by no means uncommon.

Further, it must be clearly borne in mind that abdominal malignant disease in the shape of sarcoma and carcinoma offers considerable difficulties. In malignant disease there is the same rolling up of the omentum when this is attacked, and signs the same as those met with in abdominal tuberculosis may equally present themselves.

A good illustration of the difficulties attendant on a diagnosis in some instances is afforded by the following case, which up to the last was thought to be tubercular rather than anything else:

CASE XIX. (Case 8 in Table).—A girl of three and a half years commenced to ail three months previously, and three weeks before we saw her her abdomen began to swell. She was apathetic and complained of thirst. Her abdomen was enlarged, measuring twenty inches at the umbilicus, and was dull in the flanks. This dulness did not shift on change of posture. Large blue veins coursed over the abdominal wall. The abdomen was flaccid. Lumpiness was detected chiefly on the right side, and here there was a mass which was rounded and nodular. (See Fig. 11.) It was situated in the left inguinal re-

FIG. 11.

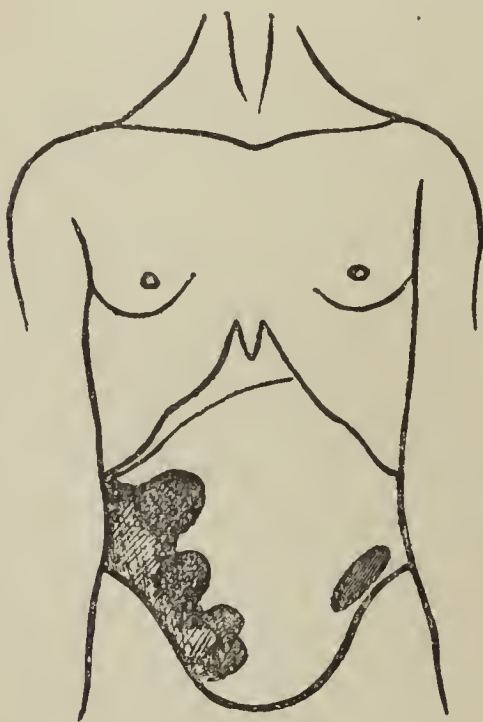
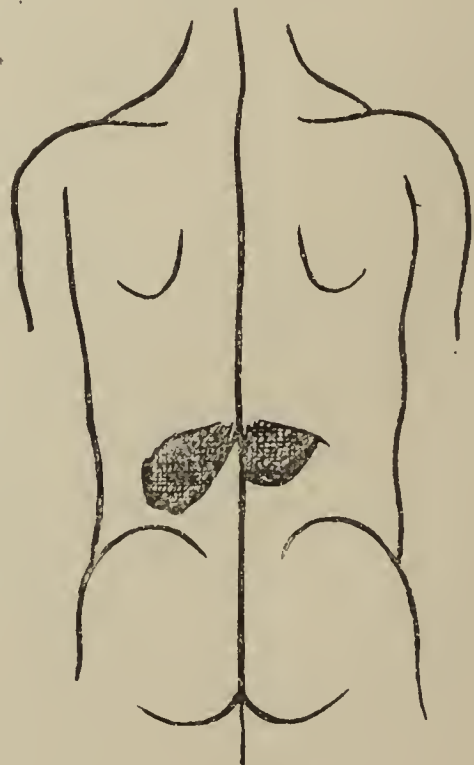


FIG. 12.



gion, directed from above downward, and overlying at the lower part the position of the bladder. In the right nipple-line, some little distance below the costal margin, was a rounded mass. These tumors were united by ill-defined lumpiness. In the left iliac fossa there was a tumor of the size of a walnut. Behind, half an inch below the twelfth rib on either side, could be felt a smooth, rounded mass (see Fig. 12), which was considered to be the kidney. The feet and legs



were œdematous. The urine was normal. Whilst under observation she rapidly emaciated; the temperature remained a point or so above the normal. There was nothing special about her evacuations. She was under treatment for sixty-two days, and finally died of exhaustion.

At the necropsy a tumor was detected as described, arising from the right iliac fossa. The intestines were turned aside. The lower mass was found to involve the cæcum; it formed a distinct tumor there, and at the same time diffused itself into the adjoining mesentery. It bound down several coils of intestine, and one especially thick deposit, the size of a thumb, passed towards the rectum. No other portion of the intestine, except at the level of the preceding deposit, was involved. The upper swelling was a round, well-defined growth of the size of a small orange, situated in the mesentery adjoining the intestinal growth. The capsules of the kidneys readily peeled. They were uniformly infiltrated with the new growth. The left ovary was replaced by the new growth. A new growth, the size of a broad bean, was found in the wall of the right ventricle.

Microscopical examination proved the tumors to be small round-celled sarcomata.

There are, of course, many other conditions that may on occasion give rise to mistake,—ovarian tumors in young children, for example. We have not attempted to make the subject of diagnosis more than shortly clinical, as befits the place, but we may remark, in concluding upon that head, that the full abdomen seen in children suffering from what Dr. Eustace Smith has called “mucous disease,” will often give rise to much difficulty. And it is also not unnecessary to say that it is by no means difficult to mistake scybala for tubercular tumors at a casual examination.

#### TREATMENT.

On constitutional measures we have nothing fresh to say. In all cases the usual line of treatment has been adopted, and cod-liver oil, maltine, careful dieting, and rest in bed, have formed the chief measures. Many drugs have been used, chiefly arsenic, chloride of calcium, and hypophosphites of sodium, but in several of the cases we have given hypodermic injections of perchloride of mercury (one-thirtieth of a grain) once a day, and we are disposed to think that possible benefit has accrued in some instances. This treatment is not altogether desirable, for it leaves indurations behind, which suggest the risk of the occasional formation of abscess, although such an event has not happened to us. Locally the time-honored mercurial application in one form or

another has almost always been adopted,—the oleate of mercury, five-per-cent. solution, perhaps the most commonly,—but it has the objection, if it be an objection, that, within three or four days at most, considerable mild pustular dermatitis arises which necessitates its temporary discontinuance. There is, however, nothing better than mercurial ointment, with or without belladonna, except that it is so dirty.

The lower bowel should in all cases be emptied daily by soap-and-water enemata, as scybala often collect, confuse the diagnosis, and disturb the bowel. Glycerin enemata of one drachm for an injection may be substituted. For the abdominal pains, which are so frequent and distressing, there is nothing better than Dover's powder in the proportion of four grains three or more times daily for a child of five, according to the amount of pain and the effect produced.

As is well known, there have been recorded in recent years several striking cases of cure of tubercular peritonitis by incision and drainage of the abdominal cavity. A case of this kind, as an instance of such treatment, we here record.

CASE XX. (Case 28 in Table).—A girl, aged two and one-third years, who was not strong, had been ailing six weeks. Her appetite was poor and her bowels confined. When seen in June, 1890, she was found to be a thin, irritable child with a swollen, tense, and seemingly painful abdomen. Large blue veins coursed over the parietes of the abdomen, the girth of which measured twenty-two inches opposite the umbilicus, the latter being excessively protuberant and reddened. The abdomen was dull all over, and there was a well-marked fluid thrill. A rectal examination gave negative results. Temperature 99.6° F. The peritoneum was opened and washed out with boric-acid lotion by Mr. G. H. Makins, and a drainage-tube inserted. In a fortnight the wound had healed, and she gradually got quite well, and continues so at the present time.

We have no doubt that such a measure is advisable for cases that prove intractable or that are going down hill, but, seeing that many cases of the ascitic variety get well by the older-fashioned methods of rest, inaction, and so forth, we think that it should be reserved as an ulterior measure rather than resorted to at first; and, inasmuch as it is not easy to see in what such treatment differs materially from simple paracentesis, the simple operation should generally be adopted first and the results watched. We should like, however, to suggest that, inasmuch as the ultimate history of tubercular tumors is in our experience by no means so favorable as has been supposed, and seeing that draining has proved useful and successful in the ascitic variety, it might be



possible in properly-selected cases to treat some of these by the removal of masses by operation when these prove to have confined themselves to the omentum. We ought, however, in all candor to say that, while we have been on the lookout for some two or three years for a fit case to deal with in this way, we have not yet succeeded in finding one.

*Results of Treatment.*—The total number of cases dealt with in this paper is thirty-one; of these fifteen are known to have died, six are doubtful, and ten are at present alive and, so far as is known, in fair health. Therefore, although we admit that tubercular peritonitis is not unfrequently cured, and perhaps more often resolves than any other form of tuberculosis, we are yet unprepared to think it other than a very fatal disease.

## ON THE TREATMENT OF PLEURISY WITH EFFUSION BY DRUGS.

CLINICAL LECTURE DELIVERED AT THE LEEDS INFIRMARY.

BY THOMAS CHURTON, M.D.,

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on Medicine in the Victoria University.

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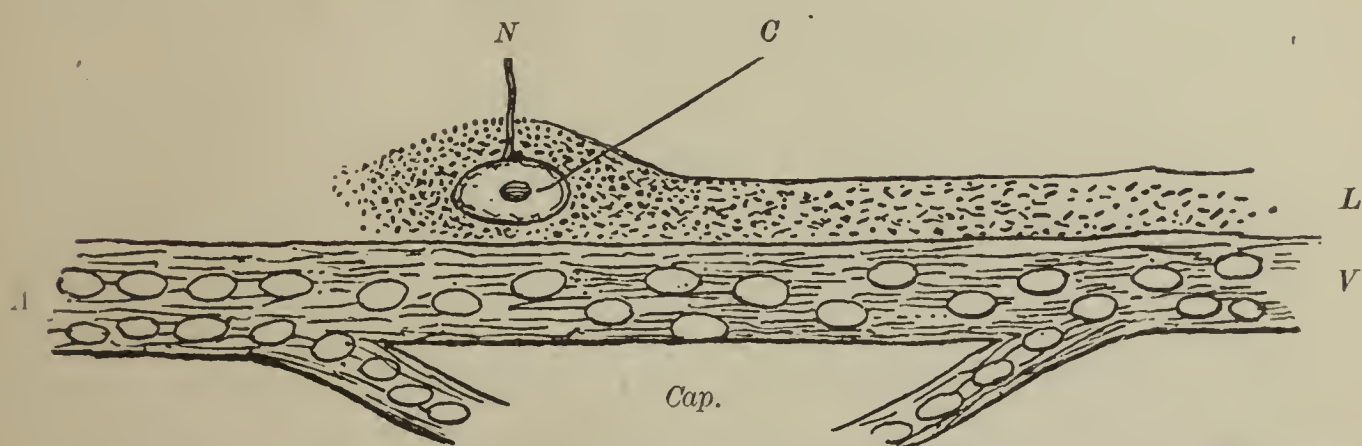
GENTLEMEN,—It is familiar knowledge that the pleura is a connective tissue or lymph-space, and that the essential element of the pleura is the endothelial cell and its smooth and slippery plate. Beneath this are ordinary connective-tissue cells and fibres with their vessels and nerves. In their ordinary state there is a very small quantity of fluid bathing the surface of the flat plates of the pleura, any excess being pressed into the openings or “stomata” which occur between contiguous cells and lead into lymph-vessels. The quantity of fluid present is apparently regulated by the surface cells, which will not allow anything to pass through them other than their own secretion, and the lymph-vessels, which here, as elsewhere, carry away (eliminate) the fluid secreted. This surface-cell and plate perform the same office for the pleura that the endothelium of the Malpighian capillary does for the kidney, permitting the passage of certain things and refusing it to others. In the glomerulus probably water only can transude in the ordinary normal state. So in the lung, the epithelium of the alveolus permits gas and water to pass through, but refuses passage to solutions of albumin and salts.

When the condition of the cell in any of these cases, taken as examples, is altered by causes to be hereafter mentioned, then not only the usually selected substances pass through, but the serum and leucocytes transuded normally or, it may be, in excessive quantity by the neighboring capillaries whose walls have been altered by the same causes, pass through the cell-plate, no longer protective or prohibitory. In the case of the pleural cell and its plate and its associated cavity there is “pleurisy with effusion.”

There is, however, a pleurisy without “effusion ;” there is also an effusion without pleurisy.



Taking the last of these first, it is the same condition as œdema of the connective tissue elsewhere, and as œdema of the lungs, the precise cause or mechanism of which is, however, not perfectly understood. The fluid delayed in the lymph-spaces in common dropsy came from the capillaries and is on its way to the lymphatics; it is easy to see how the balance may be disturbed. Any alteration in the walls of the systemic capillaries which permits a more rapid passage of their contained serum will tend to cause œdema. Any obstacle to the easy transit of lymph through the lymphatic vessels will tend to cause accumulation in the lymph-spaces,—that is, œdema. A diagram which I have used for the last fourteen years shows this and some other relations; it may be said to represent a “unit of nutrition.”



DIAGRAMMATIC REPRESENTATION OF A UNIT OF NUTRITION.—A, artery; V, vein; Cap., capillary; N, nerve-fibre controlling cell and relating it to distant cells; L, lymphatic capillary; C, cell in lymph-pool.

Dropsy of the pleural lymph-space is precisely analogous to, or rather is the very same thing as, dropsy of the subcutaneous and other lymph-spaces.

In pleurisy without effusion of fluid there is migration of leucocytes through altered vascular cell-plates, and these form a membrane by means of fibrils, which possibly they themselves spin or make *in situ*. This dry membrane is the form of pleurisy which commonly accompanies croupous pneumonia; the cells and fibrils of the membrane resemble the cells and fibrils found in the pneumonic alveoli. Occasionally in such membranes white patches are seen in which the leucocytes have failed to spin fibrils, and hence form small collections of so-called pus. In other cases, though some of the cells have spun fibrils enough to form a membrane, there are so many which have not done so,—perhaps because the poison of the disease has killed or paralyzed them,—that a purulent membrane which can be readily stripped off the pleura is the result.

Again, there may be an excessive transudation of serum with only a slight migration of leucocytes and few or no red cells; this fluid

coagulates spontaneously, in some cases, as in alcoholic patients; the fluid may contain few leucocytes and many red cells, so that a deposit of one-twelfth of the depth of the entire fluid may be formed by them, no coagulation occurring in the serum above them. Lastly, a great migration of leucocytes with a comparatively small transudation of serum and no red cells constitutes pus.

The foregoing account is rough, and does not pretend to absolute accuracy, nor to any fine apprehension of what occurs in each case, nor to the adjustment of the share of increased transudation and diminished absorption or elimination in the production of the net result. The object is simply to remind you of the variety of the results of altered nutrition in the cell-plate which are brought about by different causes, or by the same cause acting upon differently constituted though apparently similar structures in different persons.

The tissues, then, are composed of cells which form either fibres or plates having in normal conditions a certain known and definite quality and strength. The "causes of disease" are any conditions which tend to alter for the worse the cells and their plates and fibres, to make the latter ineffective in their work or duty (the plates being probably refined filters). I do not propose in the present lecture to consider the treatment of pleurisy and effusion due to every cause or combination of causes, but to speak only of those cases examples of which are now or have recently been in the hospital,—tubercular, rheumatic, alcoholic (so called), some (partly, at least) traumatic, and some due to influenza. Unfortunately, it is still, and will perhaps long continue to be, too common to speak and to write about "the treatment of pleurisy" without clearly differentiating the varieties of pleurisy. It is merely, however, a laxity of expression, for almost all of us do, as a matter of fact, attend to the causation; yet it will occasionally be observed that it is proposed to treat a whole series of cases of pleurisy with effusion in the same way, as by tonics, or by purgatives, or by iodides, or by limitation of water to be drunk, or by frequent small aspirations, or, even when the fluid is not pus, by downright incision as though it were pus. Now, what we want is to "divide and define." Suppose it once thoroughly agreed that in a given case the effusion were due to alteration in the structure of the pleural cells, etc., by the rheumatic poison. Who, knowing how perfectly recoverable are rheumatic affections in joints, would propose incision, or even repeated aspirations, except for mere mechanical reasons? On the other hand, if we were perfectly sure of what is at least probable in four-fifths of all cases of pleuritic effusion, that in the case before us it was due to the



tubercular poison, we might, if we were making no headway by other means, readily listen to a suggestion of incision, knowing what we do of the good effect of draining a similarly affected peritoneum.

Thirty years ago the frequency with which phthisis followed pleuritic effusion was insisted on by a French physician, and it has been often remarked in this country also. Five or six years ago I was struck by the benefit which followed the administration of salicylate of sodium in some cases of pleurisy. But in the greater number this drug failed. I was surprised and disappointed at the failure, for at that time I thought that, since many of the patients gave a history of chill or wetting as the cause of the seizure, just such a history as is frequently given in cases of acute rheumatism, the majority of the cases were probably rheumatic. It now appears to me, however, that the majority are tubercular, and that tuberculosis may be started on its career by chilling. It has, indeed, been supposed by some that all cases of pleuritic effusion are due to the bacilli of tubercle; but this seems improbable *a priori* and not sustained by facts. There is no apparent reason why there should not be as many different causes of disorder of the cell-plates, and consequent effusion into the pleural sac, as there are admitted to be for effusion into the sac of the hip or the knee-joint, for example. And as, when we see a recently swollen and painful hip-joint in a child become normal in a day or two under the influence of sodium salicylate, we assert that this acute inflammation was rheumatic and not tubercular in causation; so when a similar thing happens in the pleura we use the same reasoning with respect to it, for it is very doubtful whether salicylate of sodium will cause such marked and rapid amendment in tubercular cases. The temperature may fall; but usually, at least, the patient does not otherwise improve; rather he is worse; he perspires greatly, or he is deaf, or dizzy, or delirious, or his breathing is altered, and meanwhile the fluid does not diminish in quantity unless the disease is being cured by other conditions. Moreover, so soon as the salicylate is omitted, and often even before, the temperature will rise again to its former evening level, and will show the characteristic variations.

Patients in whom pleurisy has followed non-fracturing blows upon the chest may have either the tubercular or the rheumatic variety, the concussion or shock having the same share in the production of the pleurisy that is more commonly taken by chill and fatigue. But persons who drink spirits in excess and eat little may apparently acquire a pleurisy which is not due to either rheumatic or tubercular poison. At all events, salicylate of sodium will not cure them; and if they die, no

naked-eye evidence of tuberculosis is to be found in some of them. The blood, lacking the usual supply of materials for the repair of cells and fibres, starves them all. If the cells of the pleura are by original or acquired constitution the weakest, or are more exposed to altering, irritating, or de-energizing shocks or conditions, pleurisy will be the patient's first disease.

#### PLEURISY AFTER INFLUENZA.

The influenza poison produces strange results. Two deaths occurred in the Leeds Infirmary in patients who had so-called primary purulent pleurisy during the epidemic of influenza in 1890, one on the third, the other on the fourth day after the initial rigor. Eight similar cases were reported from Vienna about the same time. In ordinary empyema such a rapidly-fatal course is unheard of. The quantity of purulent fluid was quite small; it did not kill by mechanical means; the virulent nature of the poison which produced it, acting upon persons already enfeebled (one of them had granular kidneys), was the cause of death.

The excessive and long-continued pain, which patients with slighter degrees of pleurisy after influenza suffer, is probably due to the generally hyperæsthetic state of the nerves so common as a result of that disease. In a recent case this pain was relieved by morphine subcutaneously; more quickly, but for a much shorter time, by dry cupping; most completely by mustard and linseed poultices.

As I have nothing more to say respecting the treatment of this variety of pleurisy, it will not be further referred to at present. We do not know the specific antidote for the toxine of influenza, though it is probable that one exists or will appear some day in chemistry.

#### TRAUMATIC PLEURISY.

There have been two of these cases recently in the Infirmary. In one of them the pleurisy in its progress resembled a case of tuberculosis; in the other, one of rheumatism, or possibly of simple shock (traumatism) affecting the "nutritive-units" to the point of disorder and functional inefficiency. Those who have seen or heard of cases of rupture of the liver or of the spleen, and of complete division, as though by a knife, of the intestine, by mechanical violence to the abdomen which left no visible mark upon the skin, will be ready to admit that smaller shocks may bring about smaller disorders. And those who admit that all the cells of the body are constantly contending with microbes and their poisons in a daily, hourly, and even "for each instant" struggle, will readily perceive the opportunity which is offered



to such poisons or microbes as happen to be present, for assailing the damaged cells and gaining a temporary, or it may be a perfect, victory over them.

CASE I.—R. E., aged twenty-five, a laborer, was admitted on February 20, 1891. He had been violently struck in the lower part of the left side of the chest while playing at foot-ball on January 31. Two or three days after the blow he felt an increase of pain in that side. Before the injury he had been perfectly well; he had played at foot-ball regularly every winter for ten years, and had had no illness except that a year ago he had a bad cold and an ulcerated throat, caused by getting wet at his work. He had on admission the usual signs of left pleural effusion. The evening temperature was  $100^{\circ}$  F. On February 22, fifty-three ounces of fluid, of sp. gr. 1023, were drawn off by a Roberts's trocar. He was treated by salicylate of sodium and strict milk diet for six days, but the evening temperature did not fall, and the fluid re-accumulated. He looked rather pallid and delicate or fair-skinned; it was found that his parents had died early from causes unknown; the suspicion of tuberculosis arose. He was well fed and had tonics, iodoform, and picrotoxin (one-fiftieth of a grain every four hours during the night, for sweating). On March 14, the chest was again tapped, fifteen ounces of fluid being obtained. The temperature came down to a lower evening level, but was scarcely normal, when he went to a Convalescent Home on April 10. There was apparently still a little fluid in the left pleura.

CASE II.—W. R., aged fifteen, a carter, was admitted on May 12, 1891, an empty coke-cart having passed over the lower part of his chest. When taken into the surgical ward he was collapsed and pulseless, but recovered under treatment. No fractures had occurred. On May 17, fluid being found in his right pleura, he was transferred to a medical ward under my care. The heart was displaced to the left. Pulse 112, respiration 36. As the fluid was rather deeply tinged with blood, it was thought advisable to let it remain for absorption. The boy was in no distress. There was no history of rheumatism or of tubercle, but, as the temperature was  $102^{\circ}$  in the morning and  $103^{\circ}$  in the evening, five grains of salicylate of sodium were given every four hours, with strict milk diet. On May 20 the temperature was normal, and, though it rose a little after this date, when bread and rice were added to his diet, and the medicine given every six hours only,—behaving in this respect as rheumatic cases do,—the fluid steadily though slowly diminished in quantity. The progress in this case contrasts strongly with that in the case of R. E., and does not at all resemble that of a case of tuber-

culosis. It was probably either simply traumatic or due to rheumatism following and combining with injury to the pleural cells and vessels.

#### TUBERCULAR PLEURISY.

CASE I.—(Partly alcoholic.) Joseph C., aged forty-six, a clerk, was admitted on December 12, 1890. He had a pallid, alcoholic face, and stated that he had drunk very freely. In addition to a pleuritic effusion on the left side he had some cough and expectoration. This had begun a fortnight previously and had followed a wetting. His mother had had rheumatic fever twice; his father died at forty-two, of some disease of the chest. He himself, however, had had no illness beyond dyspepsia from drinking. After the wetting he had shivering, but had no pain in the joints or in the chest. There was cough with expectoration from the first day. On December 13, fifty-three ounces of fluid were drawn from the left pleura. The salicylate was tried, but even small doses disagreed, and it did not succeed; for, though the temperature fell at first, it afterwards rose in spite of the drug and strict milk diet, proving, as it seems, what had previously been suspected, that in this case the disease was not rheumatic, and, with other facts, strongly suggesting that it was tubercular. Under treatment by quinine, iron, and strychnine the temperature fell and the patient greatly improved; he was sent to a Convalescent Home, his temperature having been about normal for a fortnight, on March 7, 1891.

The failure of the salicylate in this (non-rheumatic) case appears from the chart:

Temperature.		Pulse.	Respiration.	Treatment.	Diet.
December.	Morning. Evening.				
13	99° 100.5°	104	28	Paracentesis, 53 oz. Salicylate, gr x, 4 hours.	Milk only.
14	99° 99.2°	98	24		
15	97.6° 98.5°	90	24		
16	98.4° 99.8°	102	24	Salicylate stopped; it had disagreed.	
18	98.4° 100.4°	100	24		2 eggs daily.
21	98.4° 99.8°	100	24	Salicylate 4 hours.	Milk only.
22	98° 101°	100	32		
23	98.4° 102.6°	90	24	Salicylate stopped.	Fish, chicken, etc.
24	99° 102.6°	104	24	Quinine, tr. ferri, strychnine.	
25	98° 97.2°	100	24		
26	97.4° 99°	92	32		
27	98.5° 100°	100	24		



The temperature after this date was about the normal, until he was chilled by an open window on January 6, after which date, though normal in the morning, it rose to 102° or more in the evening :

1891.	Temperature.		Pulse.	Respiration.	Treatment.	Diet.
January.	Morning.	Evening.				
6	96.6°	102°	104	25		
7	98.2°	103°	96	20		
8	98°	97.4°	96	24	Salicylate resumed at 10 A.M.	
9	98°	100°	98	26		
10	98.4°	101°	96	24		
11	99°	102°	100	24	Salicylate stopped.	
12	99°	100°	92	24	Quinine, etc., renewed.	
13	98°	100°	88	24		
14	98.4°	98.4°	84	24		
15	98.6°	98°	92	24		

In this patient there was possibly hereditary weakness of lung and pleura ; in addition, these tissues suffered with the others, from want of reparative material ; lastly, the wetting reduced them to a state of incompetence to destroy the bacilli of tubercle which happened to be present. Food and tonics, with rest and the removal as far as possible of all adverse influences, restored them. Cases of tubercular pleurisy recover in very various modes and times ; some slowly and regularly ; some, after long delay, at last very quickly ; some with tonics ; some with change of air or of house ; some with change of drugs or of diet. In time the greater number of cases of pleurisy do recover under ordinary care, though, unless the *causation be completely elicited and each element of it separately attended to, removed or opposed*, the duration of a given case may be very long,—until, in fact, the causes or some of them are removed accidentally,—or tuberculosis of lungs or of joints may succeed the pleurisy without any delay.

CASE II.—Miss W., aged forty-five, of rather delicate constitution, had pleurisy with effusion, after a chill, in June, 1888. Fifty ounces of fluid were taken from the left side. Salicylate in ten-grain doses caused perspiration and exhaustion. Under quinine she improved ; the fluid disappeared ; but disease began in the right shoulder-joint, and after slowly progressing for ten months she slowly recovered in a few months more.

CASE III.—Edward R., aged sixteen, a hospital patient in 1888–89, had a very similar history, pleurisy being followed by disease of one knee and subsequently of the spine.

## RHEUMATIC PLEURISY.

CASE I.—Sarah H., aged nineteen, was admitted on January 23, 1891. She had been ill only three days, and was supposed to have pneumonia of the right lower lobe. The temperature was  $102^{\circ}$ , but reached  $103.6^{\circ}$  on the eighth day of the disease. On the tenth day of the disease very marked Skodaic resonance was found over the upper lobe. On February 4, no sign of crisis having occurred, the left axilla was explored and fluid found. The strict milk diet was continued, and fifteen grains of salicylate were given every four hours. The temperature fell regularly; it was subnormal on February 15. Rice pudding was given on and after the 10th; eggs after the 12th; bread after the 19th. The salicylate was given three times a day after the 16th, and was stopped on the 21st. She was discharged cured on the 24th. The fluid in this case was considerable in quantity, and would have been drawn off if the patient would have consented to the operation; all signs of its presence had, however, disappeared within three weeks under treatment adapted to rheumatic pleuritis.

CASE II.—Eliza A., aged nineteen, admitted August 12, 1890. Exploration discovered a left pleural effusion. She had been in the hospital previously, from June 9 to July 8, 1890, with tonsillitis and rheumatic swelling in several joints, and was cured by salicylate treatment. Pain in the chest began on August 7.

August.	Temperature.		Pulse.	Respiration.	Treatment.	Diet.
	Morning.	Evening.				
12		$101^{\circ}$	132	44	Salicylate, gr. xx, 2 hours.	Milk only.
13	$99^{\circ}$	$98^{\circ}$	120	28	Salicylate, gr. xx, 4 hours.	
14	$98.2^{\circ}$	$99^{\circ}$	96	24	Salicylate, gr. xx, 8 hours.	
15	$98.8^{\circ}$	$99.6^{\circ}$				
16	$98^{\circ}$	$99.4^{\circ}$	108	20		
17	$98^{\circ}$	$98.5^{\circ}$				
18	$98^{\circ}$	$98^{\circ}$	94	24	Salicylate stopped (19th).	
21	$97.8^{\circ}$	$98.8^{\circ}$	72			Fish, chicken.
24	$98.4^{\circ}$	$98^{\circ}$	84	18	Quinine. Up.	
28	$97.4^{\circ}$	$98.4^{\circ}$			Sent to Convalescent Home.	

There appeared to be little or no fluid left in the chest on August 28.

CASE III.—In this case an affection of joints, which appeared to be rheumatic, followed pleuritis. Wm. P., aged thirty-eight, was admitted on November 11, 1890, for pain in the left side and palpitation. Temperature  $104^{\circ}$ , pulse 96, respiration 28. Heart-sounds normal;



cough, but no expectoration ; at left base dulness and diminished vocal fremitus ; friction-sound over upper lobe from second interspace in front ; sharp pain on inspiration.

The patient had been a soldier, and a few years ago had had rheumatism, which kept him in bed for three months at Gibraltar. He is now a brushmaker, working in a hot, close, smoky room. In August last he caught cold, but otherwise was well until six weeks ago, when he had pain in the chest, and some difficulty of breathing and palpitation, but no pain in the joints.

Progress of the case :

Temperature.		Pulse.	Respiration.	Treatment.	Diet.
November.	Morning. Evening.				
11					Milk only.
12	101°	104°	120	36	Salicylate, gr. xx, 4 hours.
13	100.5°	101.6°	112	32	
14	99°	101°			
15	98°	101.2°	112	36	Salicylate, gr. xx, 6 hours.
16	99°	99°			
17	99°	99.8°	104	28	
18	97.2°	98.4°			
19	97°	97.2°	72	28	Salicylate stopped. One egg daily.
20	97.2°	97.4°			
21	96.2°	97°			
22	97°	97.6°			
23	96.4°	97°			
24	97°	97°	60	20	Two eggs daily. Bread and rice.
25	96.2°	97.2°			
26	96.2°	97°		Up.	
27	96.4°	99°	80	28	Pains in joints, etc.
28	98.4°	101.4°	96	28	Bed.
29	100.6°	103°	108	24	Salicylate, 4 hours. Bread and milk ; barley gruel.
30	102°	104.4°			
December.					
1	100.2°	103.2°	104	30	
2	101.2°	100.6°	120	28	Milk only.
3	100°	99.8°	104	24	
4	99°	99.2°	100	24	
5	98.8°	99.5°	98	20	
6	98.4°	97.5°			
7	97°	98°	64	20	Salicylate stopped. Egg.
8	98.4°	99°			
9	98.5°	98.4°	80	20	
10	98°	98°			
13	97°	97.4°			Two eggs.
15	97°	97.4°			Plain diet.
22	97°	98.4°			Fish, chicken.

The pain was in the ankles, knees, and shoulders, chiefly, but was described by the patient as continually shifting from one joint to another. Pain also returned in the left side, but no friction could be heard. It will be observed that, as often happens in rheumatic cases (arthritis), the temperature did not fall until a strict milk diet was insisted upon.

Some time ago a girl who had been in bed six months with relapsing rheumatic fever recovered in three weeks when in addition to salicylate treatment a strict milk diet was enforced. Patients are often extremely discontented with this diet; eggs seem less injurious than bread-and-butter; a little bread in hot milk also usually does them no harm.

It is not pretended that the examples adduced amount to an absolute demonstration that there are cases of rheumatic pleurisy without other signs of rheumatism (arthritis, pericarditis). It will be difficult to prove this on account of the variability of cases both of rheumatism and of tuberculosis as to duration and mode of recovery. I have recently seen or heard of three patients each of whom about twenty years ago was under my care for what was then called "simple"—probably rheumatic—pleuritic effusion, and recovered quickly without salicylate and without aspiration. The oldest patient was then fifteen and the youngest four years of age. They are all quite well and have never shown any signs of tuberculosis. Until we are able to find bacilli or their products with ease and certainty in the pleuritic fluid, it will be hard to assert the causation with confidence. A long series of coincident administrations of salicylate with prompt recoveries is necessary to establish an opinion that the drug is an absolute cure for a certain sort of cases. For we know that under new and improved conditions of life a peritoneal effusion, which there is much reason to consider tubercular, will sometimes be absorbed in not many days. On the other hand, may not some cases of ascites be rheumatic in origin? The pleura is less frequently affected by the rheumatic poison than the joints; the peritoneum than the pleura. Cases of general acute inflammation of the serous membranes, occasionally described, and one example of which was under my care in the Leeds Fever Hospital some years ago, are very possibly rheumatic. The following is probably a rheumatic case.

CASE IV.—Ann S., aged sixteen, admitted August 18, 1890, for swelling of the abdomen, first noticed three weeks previously. Fluid in peritoneum and in left pleura. No cause known. The patient is a weaver, of fragile build.



*September 3.*—Sixty-three ounces of fluid, of specific gravity 1020, drawn from left chest. *14th.*—Temperature continues to vary two degrees between morning and evening,  $98^{\circ}$  to  $100^{\circ}$ . She has been under treatment by tonics, hypophosphites, chicken, etc. Strict milk diet now ordered. Sodium salicylate given, ten grains every four hours, until the 16th; afterwards every eight hours until the 18th. The temperature became normal immediately. On September 25 the patient was up, with all fluid gone from the peritoneum and pleura.

This improvement, though very quick, is not more quick than is habitually seen in cases of rheumatic arthritis similarly treated. I do not, however, profess to have advanced beyond the “strong impression” stage as to the truth of the proposition, that while the greater proportion of the whole number of cases of pleurisy with serous effusion are due to the tubercular poison, and a small number to some other causes, a considerable number are caused by the rheumatic poison, and are curable by milk diet and salicylate of sodium.

# Surgey.

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## DIAGNOSIS OF ABDOMINAL HERNIA.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL  
SCHOOL AND HOSPITAL.

BY W. B. DE GARMO, M.D.,

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School and Hospital.

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GENTLEMEN,—I propose devoting my hour to-day to the consideration of the diagnosis of hernia, and have selected the cases that I shall bring before you, so far as I could do so, to illustrate various practical points which it is important that you should keep in mind. I shall also endeavor to recall to your minds certain affections which so closely simulate hernia as frequently to mislead us.

If a patient comes before you complaining of a weakness or dragging pain in the lower part of the abdomen, which is worse at night and better in the morning, which is increased while straining at stool, in sneezing, or coughing, and especially if, on examination, you find a tumor which disappears, or may be reduced, when the patient is in a recumbent position, then we are usually safe in making a diagnosis of hernia.

Unfortunately, however, all of the cases demanding our attention do not present such a clear history. In fact, in examining a great number of cases, as they come to us at this clinic, we shall find scarcely two alike, even of those who have hernia, while we shall meet with many others where only by the most careful discrimination can it be positively stated whether it exists or not.

In the consideration of this branch of the subject it has been my custom to divide those tumors which are liable to be mistaken for hernia into those that are reducible and those that are irreducible.

First to receive our attention will be those tumors which most closely simulate hernia, from the fact that they are reducible (or appear to be) to the cavity of the abdomen, and in this list will be included hydrocele of the vaginal process of the peritoneum (*tunica vaginalis*),



hydrocele of the funicular division of the tunica vaginalis, varicocele, abdominal varix, abscess, undescended testicle, lipoma, etc.

A knowledge of the formation and descent of the testicle affords an insight into the cause and origin of many hernias, especially in early life, and has direct bearing upon some of the complications which may arise during treatment.

You will remember that the testicle is primarily formed just below the kidney and behind the peritoneum; from this place it migrates to its natural abiding-place in the scrotum. This transition should be completed by the end of the ninth month of intra-uterine life, but, owing to adhesions within the abdomen, shortness of the cord, or from reasons which we cannot discover, it may not come down until after birth or even quite late in life. It may lodge and become stationary at any point in the canal, or after passing out at the external abdominal ring, in some instances it may be easily reduced into the canal and apparently into the abdominal cavity. The testicle is preceded in its passage through the canal by a fold or pouch of peritoneum which covers its anterior surface with its two layers.

The neck of this pouch, which communicates with the cavity of the abdomen, should be obliterated at birth, leaving that part which is anterior to the testicle a shut sac, the cavity of the tunica vaginalis. It is within this cavity that hydrocele so frequently forms.

On the one hand, the testicle comes through the canal after birth, the canal being thereby weakened and dilated, predisposing to hernia, and, on the other, there is delay in the obliteration of the neck of the tunica vaginalis. Then we again have an open pouch into which the bowel may readily drop, forming congenital hernia. In speaking on this point, I should like to call your attention to a fact that some of you may have overlooked, and that is, that in the female the formation and migration of the ovary are identical with those of the testicle in the male, up to the point when the latter leaves the abdomen, and the similarity goes still further by the pouch of peritoneum passing down the inguinal canal, in the female, forming the canal of Nuck. Hernia into this canal forms a counterpart to congenital hernia in the male.

It is rather rare, but I have had the opportunity of showing to a former class hydrocele in the canal of Nuck, which had been sent to me as a case of inguinal hernia.

*Hydrocele* occurring in infants or early life may be reducible, for it not infrequently happens that there remains a small tubular canal between the tunica vaginalis and the cavity of the abdomen, which is large enough to allow the passage of fluid, but is too small to permit

the passage of a loop of intestine. The first case that I shall show you to-day illustrates this point, and one or two others, as well as any that I could bring before you.

This boy, aged seven years, came to the clinic six months since with congenital hernia of the left side, the contents being intestine, and the protrusion, the size of a hen's egg, having existed for three years. A truss was applied, and the hernia has been perfectly retained night and day. No protrusion of the hernia has been seen for five months. Two months since the boy was brought here with a recurrent swelling in the scrotum, somewhat larger than that now to be seen. The parents naturally supposed that the hernia had returned, but examination proved it to be hydrocele. Now, if I place this boy on his back and elevate the scrotum, you will see that the tumor gradually grows smaller. I place a finger over the inguinal canal, making slight pressure. You will now see that the tumor has disappeared, and still I have felt nothing pass my finger. If the tumor had been made up of any part of the abdominal viscera, I should certainly have felt it slip through the canal. Now I shall keep my finger on the canal and have the boy stand. Please observe what takes place. He has been on his feet but a few moments, but you will notice the tumor returning to the scrotum. Do not fail to notice that the return is first to be observed at the bottom of the scrotum. This would not be if the bowel were coming down; you would first see bulging just over the pubic bone. Now that the tumor has almost fully returned, I want you to observe another point closely. By taking the spermatic cord between the thumb and finger, and tracing it up to the external abdominal ring, you will notice that there is no thick neck, as of a hernia protruding at this point; in fact you can feel nothing that does not belong there.

This is a case of hydrocele occurring during the treatment of a congenital hernia, and is a typical case. Some of you have seen many others before at this clinic. It is one of the complications that I look for during the treatment of this form of hernia. I have also shown you this same form of hydrocele where hernia has never existed, and, as you know, I put trusses on those cases to prevent the formation of hernia. Now you will ask as to the treatment of this case. Nothing will be done with it unless the quantity of fluid should increase so as to distend the scrotum to quite an extent, then it would be drawn off. Perhaps you wonder that I do not inject something to produce a radical cure; but if you recall the fact that we are dealing with a pouch that is in direct communication with the peritoneal cavity, you will at once see that this would be injudicious, if not absolutely dangerous. Further-



more, this is unnecessary, as I expect that this fluid will be reabsorbed within two or three months, as I have seen in many other cases. This tumor, in fact, is now smaller than when last seen.

The points to be particularly borne in mind are : that the tumor is first noticed low down in the scrotum ; that it develops upward instead of from above downward ; it returns to the abdomen slowly, never suddenly, as in hernia ; it is translucent ; the neck of the tumor is very small, and the testicle cannot be readily distinguished.

I have, perhaps, spent more than the allotted time on this case ; but it represents a large class, and it is important that you should recognize them, and explain their true condition to the parents, or you will bring unjust criticism upon yourselves, as otherwise it is sure to be thought by them that the hernia is not being properly retained.

The use of the truss will accomplish two important ends. Where hernia has never existed, it will prevent the dilatation of the canal and final protrusion of intestine ; and where it has, it will, by its pressure, aid in the obliteration of the neck of the canal, and the ultimate cure of the case.

*Varicocele*, as ordinarily seen, is readily distinguished from hernia ; but occasionally we will meet with an extreme case, where the size of the tumor, its partial reduction in the recumbent position, and its recurrence upon standing, will mislead any but the most careful and experienced observer.

During the past year I have seen in my private practice four or five such cases ; one man made the trip from Texas, and another from Ohio, to be treated for hernia, which did not exist. Both cases were looked upon by physicians who had examined them as uncontrollable serotal hernias. The cases closely resembled some of those neglected serotal hernias wherein the hernial sac is much thickened, except in one particular, and to this point I wish to draw your especial attention, for in it we find the most reliable guide to diagnosis. In reducing a large hernia it may resist taxis for a time, then suddenly we will feel a portion of the mass slip back through the canal, and the remaining tumor may be readily and quickly reduced. In varicocele the reduction takes place in quite a different manner. If the tumor is grasped in one hand, and the thumb and fingers of the other are applied to its neck, in the inguinal region, it will readily be observed that, while the mass is gradually growing smaller, there is no movement noticeable through the neck of the tumor.

The empty veins will also form an irreducible body in the scrotum, and some writers look upon this as the most important diagnostic point.

I do not consider this a reliable guide, however, as an elongated and adherent piece of omentum, or an old and thickened hernial sac, may so closely simulate the thickened vessels as to make diagnosis very uncertain.

The test shown you in the boy with reducible hydrocele applies to these cases, as regards the recurrence of the tumor in the scrotum while the patient is standing and while you are guarding the canal with your fingers. The tumor will not be first found at the bottom of the scrotum, as in the hydrocele, nor will the neck of the tumor be as small. In these enormous varicoceles there is usually a thickening of the cord, due to the enlargement of the veins, well up to the external abdominal ring. There are also softening and atrophy of the testicle in almost every case.

Varix of the superficial abdominal veins that cannot be readily distinguished from hernia is rarely met with, but I have in two cases seen it resemble an inguinal protrusion so closely as to deceive several physicians.

I had an opportunity last winter of bringing a man before this class who had varix in the femoral region, which misled a large number of the gentlemen present. The tumor was in every respect, so far as appearance indicated, identical with that which we ordinarily see in a femoral hernia. Its location, shape, and size corresponded exactly with hernial protrusions in this region.

I placed my hand upon it, while the man was in a standing position, and found that under moderate pressure the tumor quickly disappeared, and at once reappeared when the pressure was removed. This was quite contrary to experience with femoral hernia, which it is difficult, in fact usually impossible, to reduce in the standing position, but which is slow to again protrude when once reduced.

Upon having the man's legs stripped, my suspicions were readily confirmed, for at several points upon the leg of that side were knots of varicose veins. In fact, so far as my experience goes, I have never seen a case of varix in the inguinal or femoral region that did not present even more positive indications of the same condition in the veins of the lower extremity.

A varicose condition of the lymphatic vessels of the femoral region, or even those leading from the testicle into the abdomen, may furnish us with most perplexing cases for diagnosis, but, fortunately, they are very rare; they possess the peculiarities of semi-solid tumors, slowly reducible, leaving a mass of thickened vessel which cannot be returned.

*Abscess* presenting in the inguinal or femoral region has been mis-



taken for hernia by many reputable practitioners, and even by experienced surgeons. All swellings in these regions should be looked upon with suspicion where Pott's disease of the spine or psoas abscess is known to exist or is suspected.

I saw such a case a few years since, where the tumor was in the inguinal region, and which under pretty strong compression could be almost wholly reduced. The slowness with which it was reduced under strong pressure, the thickening of tissues in its immediate vicinity, and the fact that the boy had Pott's disease, convinced me that it was an abscess.

On the other hand, the medical gentleman who had the case under care was so thoroughly confirmed in his belief that it was hernia that he would not even consent to the introduction of a hypodermic needle.

He was soon convinced of the error to which he had committed himself, however, by the spontaneous opening of the enlargement and discharge of the contained pus. The tumor was in the immediate vicinity of the external abdominal ring, appeared reducible, but was not wholly so, and gave some impulse on coughing.

My esteemed and lamented friend, the late Dr. Cabell, of the University of Virginia, sent me a similar case shortly before his death. The boy was about sixteen years of age, the son of a physician, and had had Pott's disease in early life. There had been no symptoms of the disease for several years; he had enjoyed an active out-door life, good health, and it was believed had been entirely cured of his spinal disease. Shortly before he came to me a small swelling was discovered in the inguinal region. The father and another physician examined it, and at that time, as they believe, it was wholly reducible. Dr. Cabell examined it later, and found it only partially so, and in this condition it came to me. The boy could by squeezing the tumor cause a part of it to very gradually disappear, but it returned at once when pressure was removed, even when he was lying on his back. The diagnosis of abscess was made and its opening advised so soon as it came a little nearer the surface. Four weeks later the father wrote me that he had opened it, and that about eight ounces of pus were discharged. In this case neither before nor after the opening of the abscess was there any evidence of the return of the original disease, and, as the discharge continued only a short time, it is reasonable to suppose that the pus had been for several years shut up in an abscess-cavity in the vicinity of the spine.

Psoas abscess is more likely to "point" in the femoral region and be mistaken for that form of hernia. The history of these cases, the

peculiar fluctuating character of the tumor, and its partial reduction should leave little room for error in their diagnosis.

It is well to remember that in all fluid tumors we are quite likely to get "impulse upon coughing." This impulse is frequently dwelt upon in the books as an important diagnostic sign of hernia, but experience convinces me that its importance is greatly overrated, and that, while its presence must be weighed with other evidence, it cannot be accepted as a positive indication that hernia exists.

While speaking of fluid tumors, I wish to call your attention to a complication liable to arise in almost any case under care, and in this connection, I show you this little boy, six years old. Two years ago he came to my clinic with double oblique inguinal hernia. He did nicely for two or three months, when he had an attack of scarlet fever. After he recovered from this and returned to the clinic, I noticed that there was swelling in the scrotum on both sides. Examination showed that it was fluid. This fluid could not be retained within the abdomen, and the distention of the scrotum became so great that I was obliged to have a suspensory bandage put on the child. The truss was kept on,—not on account of the hernia, but to prevent as much as possible the distention of the canals. After a time the child's general condition began to improve, the abdominal ascites disappeared, and the case has gone on to a cure, as you now see it. It is not an uncommon thing, in attending hernia, to see the very earliest indication of peritoneal effusions by fluid which comes into a hernial sac, and, as I shall tell you when I come to lecture on the mechanical treatment of hernia, it is useless to attempt to keep it within the abdomen. I have seen men in the last stages of heart-trouble who gave far more thought to fluid which would fill up an old hernial sac than to the fatal disease which was its origin. When there is a quantity of fluid in the abdominal cavity the intestines are floated away from the hernial openings, and do not protrude. Your patients, therefore, run no risk of strangulated hernia when in this condition. If they can continue the use of their trusses without too much discomfort, it is better that they should; but they are not subjecting themselves to any serious risk if obliged to abandon them for a time.

The next two cases which I shall show you are selected to illustrate a large and troublesome class. When your attention has been called to them, you will not find diagnosis difficult (and that is what we have under consideration to-day); but you will find them very perplexing cases to treat.

This man is fifty-nine years of age. He remembers having a



rupture since childhood, on the left side. Until within the last year he has had a great deal of trouble and pain, produced by various trusses that he has worn. As he stands now, you would scarcely notice anything peculiar in his condition, except that the scrotum is smaller upon the left than upon the right side; if, however, you take hold of what appears to be a small testicle on this side, you find that it is soft and compressible,—in fact it is nothing but fluid. If you follow the sac containing this fluid, you will find just outside of the external ring a small body not much larger than the first joint of your index finger. This is the testicle, and, although small, it is very sensitive. Now, the history of this case is very clear to us. This testicle did not come down through the canal until after birth, perhaps not until after the child was four or five years of age. It was then reduced with the hernia, which it is probable existed, and has ever since been kept in the canal by the truss worn. Even in the later years of this man's life, that testicle has made the most persistent efforts to get out of the canal. When I saw the man one year ago I put on the truss which he now wears, with a small pad pressing high up over the canal. In this position it has allowed the testicle to come out of the external ring, and still has, by very moderate pressure, prevented the protrusion of the bowel. The man has experienced the greatest relief, and is perfectly satisfied with his condition. If we could not make him comfortable by mechanical support, then it would be our duty to operate, and remove the offending and useless gland. The operation is attended by little or no danger, and if the canal be properly treated at the time, a complete cure of the hernia is almost certain to result.

I am very glad that a member of the class has asked regarding the fluid in the scrotum. This is probably a condition of hydrocele of the vaginal process of the peritoneum. This peritoneal pouch preceded the testicle to the bottom of the scrotum, and would have become the tunica vaginalis had not nature been thwarted in her designs. The fact that the fluid can be pressed out of this sac shows that it is in direct communication with the abdominal cavity. Its neck has not been obliterated.

I now show you another case of this class in this boy, eighteen years of age. In his case also you will notice the smallness of the scrotum on the left side. You will find the fluid also, although at times that is entirely absent. This boy has been under my care for eight or ten years, and while the testicle has been kept out of the canal by the truss, there has been no tendency for it to go down into the scrotum, where it belongs. In accordance with my usual custom, I have taught him how

to draw the testicle down as low as possible, by grasping it gently between the thumb and finger, and putting the cord on the stretch.

I have reason to believe that he has followed my instructions faithfully, but with little benefit. The time has come, it seems to me, when we should consider some other means of affording him permanent relief. So long as the testicle lies just outside of the canal he is obliged to wear a truss, both for the purpose of keeping it outside the body, and for preventing a hernial protrusion through the canal. Men who have studied this subject carefully assure us that these ill-developed glands are practically useless. At any rate, this young man has one well-developed testicle, and I am sure that we shall act in his best interest to remove the imperfect one. In doing this we shall, of course, do everything in our power to obtain for him a radical cure of the hernia.

These delayed testes may be of normal size, and become lodged in the canal between the two rings. I have seen such a case in consultation, where an orchitis, developed as the result of the manipulations of a truss-seller, had been diagnosticated as strangulated hernia by a man of considerable experience.

In early life these cases are very common, as I have frequently demonstrated to you at this clinic, and you should be especially careful in examining infants, to see that both testicles are in the scrotum. If the organ be missing, and you cannot find it outside the external ring, then it is better not to apply a truss, even though hernia exist. By delaying treatment you will in all probability succeed in getting it outside, and then holding it down, and the hernia up, by a light pressure over the internal ring. This method, followed in infancy, will be almost uniformly successful, both as regards the descent of the testicle and the permanent cure of the hernia.

I have seen a number of cases of hernia of the ovary where this organ was as persistent and troublesome, in its attempts to descend through the canal and remain down, as have been the delayed testes. In one I have found it impossible to keep the ovary within the abdomen, in another the ovary was removed by the late Dr. James B. Hunter, and in still another the truss worn retains the organ perfectly, except during menstruation, when it is impossible to keep it within the abdomen.

I will return to the subject under consideration by showing you this man, thirty-nine years of age, a grocer. He gives a history of having had a rupture for ten years. He has for the past five years worn the truss which you see upon him. I have not allowed it to be removed because I wish to condemn it. As you see, it consists of an elastic band



about the body, with perineal straps to hold it in place. It is known as the "elastic truss," and is certainly the poorest appliance at present used in the treatment of hernia. These trusses, with rare exceptions, act only as a compress over the pubic bone, leaving the upper part of the canal entirely unprotected. After a time the canal is dilated to such an extent that the protrusion evades the pad and passes into the scrotum. In this case you will see that there is an enormous tumor in the left side of the scrotum. I now place him on his back and attempt to reduce it. A portion of it has slipped back; but here is a large, heavy mass of irregular shape which cannot be replaced, and he tells me that this has not been back for nine months. Now we must decide what this mass is, and where it belongs. If I follow the tumor towards the abdomen I find that it is connected with that cavity by a thick neck. From its weight and its irregular surface, I believe it to be omentum. It is dull on percussion, indicating that the bowel forms no part of the present protrusion. I am sure that a portion of that part returned was bowel, as it went back with its characteristic "gurgle." There is another symptom which convinces me that bowel protrudes in this case, and that is, that the man complains of "colicky" pains in the umbilical region after he has been on his feet for a time, which disappear entirely when he lies down. You should be very suspicious when patients who have hernia complain of these pains. They are nature's caution signal, and should be heeded. Critical examination will be almost sure to reveal the fact that their hernias are not being properly held. In these old, neglected, or improperly-treated cases, the omentum readily forms adhesions to the sides of the hernial sac. The intestine may also come down, but, owing to its natural peristaltic motion, it is less liable to become adherent. You must remember, however, that this function of the bowel is gradually lost in the loop which protrudes into the scrotum, and, if once fastened down, it is usually only a question of time when faecal impaction and intestinal obstruction occur. These patients, when they reach this stage, almost always die, for the reason that, even though the bowel be liberated and returned to its normal cavity, it does not resume its functions, and impaction again occurs.

Now, what shall we do with this patient? He has a mass of omentum which seems firmly adherent at many points. First of all, we should not decide positively that this cannot be returned until we have made several attempts. In many instances the adhesions are slight and can be broken up by gentle manipulation. There is a man now present in the clinic, whom most of you will recognize, whose case was of this kind. He had come for the last attempt at reduction and was

to go into the hospital for operation. Just as I told you that I should in all probability fail, I succeeded in reducing his hernia, and he now retains it by a comfortable truss.

The man now on the table positively declines any operative interference, so that we have only two alternatives. Attempts at reduction, which will probably fail in this case, and the use of a truss over the neck of the tumor, to retain the intestine, allowing the omentum to remain where it is. This can in a measure be accomplished, but the man still runs a greater risk from strangulated hernia and the dangers of an operation under unfavorable conditions than he would from going into the hospital and having the mass cut away, with an attempt at radical cure. These are certainly cases where it is our duty to operate if we can obtain the consent of our patient. There is little encouragement to be given them as to improvement under mechanical treatment. I should expect in the case before us to see the man in a worse condition a year hence, and then, perhaps, not in as good physical condition for an operation as now.

The diagnosis of tumors of the scrotum, other than hernia, is usually easily made, from the fact that they have no connecting neck with the abdomen, and, lest I have already overtaxed your patience, I shall merely make mention of a few that are most frequently met with. Some of you saw, not long since, a case of hæmatocele which was at first quite perplexing, from the fact that the child was under treatment for hernia. There was, however, the history of a fall, the immediate development of the tumor, its weight, and its lack of connecting neck with the abdomen, all serving as guides to a correct conclusion.

Hydrocele of an old hernial sac the peritoneal neck of which has become obliterated, hydrocele of the tunica vaginalis, tubercular testicle, may at times cause some doubt in your minds, but careful examination upon the lines already suggested will in almost every instance lead you to a correct diagnosis.



# TUBERCULOSIS AND EXCISION OF THE KNEE-JOINT.

CLINICAL LECTURE DELIVERED AT MERCY HOSPITAL, CHICAGO.

BY EDMUND ANDREWS, M.D., LL.D.,

Professor of Clinical Surgery in Chicago Medical College; Surgeon of Mercy Hospital, etc.

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GENTLEMEN,—I present before you to-day three cases of supposed tuberculosis of the knee-joint in three different stages of progress.

The first, if tuberculous at all, is in the non-suppurative stage. In the second suppuration has just commenced. In the third, caries of the bone and abscesses have been so fully established that I shall have to excise the joint.

The diagnosis of this disease is not always easy at the beginning, because some of the typical symptoms may be absent, and much of the history of the case may be unobtainable, or erroneously stated to us.

However, I shall first point out to you the general list of proofs natural to such cases, and then show which of them are present in each of these patients.

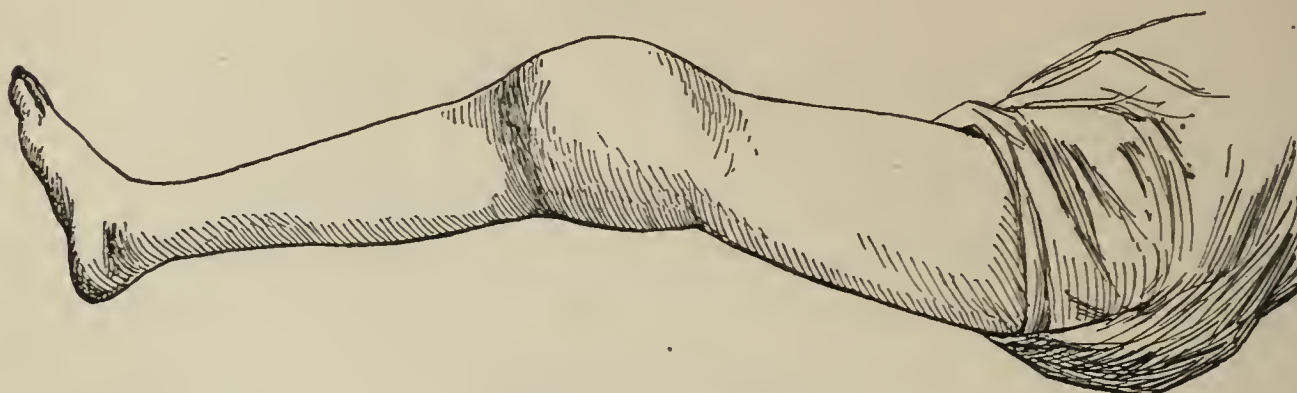
1. *Heredity*.—This alone proves nothing decisively; yet where a patient comes from a tuberculous parentage, it supports and strengthens the more direct proofs.

2. *Appearance of the Part*.—When the chronically diseased knee presents a rounded, voluminous swelling, occupying the entire circumference of the joint like this one which I bring before you, the very form of it almost proves the case to be tubercular. Notice particularly the smooth, massive swelling (see Fig. 1) extending all around the joint of the second of these three patients, and observe how it suddenly tapers off above and below, and how the leg and thigh beyond the swollen part have a spindling, emaciated look from atrophy of the muscles.

3. *The Simultaneous Presence of Tuberculosis in other Parts of the Body*.—This is a very strong evidence that a disease in any joint is of like character.

4. *The Great Majority of Chronic Inflammations of the Knee are Rheumatic, Syphilitic, Traumatic, or Tubercular.*—Now, if there be no history of rheumatism, syphilis, or traumatism, we arrive by the process of exclusion at tuberculosis as the probable condition.

FIG. 1.



Tubercular knee-joint.

There is, however, a difficulty of this sort. Moderate strains and injuries originate, or at least precede, true tuberculosis of the knee even more frequently than severe ones; so that traumatism does not positively disprove tuberculosis. On the other hand, a mild synovitis set up by the injury may be mechanically aggravated by walking, and become chronic without the help of any known bacilli, and at length present the same aspect as many cases of true tuberculosis.

If a case of simply inflamed knee, following a bruise or a strain, in which rheumatism and syphilis are absent, be treated by immobilization and extension, it more rapidly recovers than a tuberculous one, though the tuberculous patient may get well slowly; but if such a case proves rebellious and progresses in spite of the treatment, it establishes a pretty good certainty of tuberculosis.

This swelling may be elastic or fluctuating, according to the presence or absence of purulent or synovial effusion.

5. *The use of Koch's lymph* is believed to assist the diagnosis by causing a temporary febrile reaction of some energy in truly tuberculous cases, and by not producing this reaction in those that are not tuberculous.

6. Where there is suppurative effusion present, the fluid can be examined by the microscope for bacilli, and small bits of the suspected solid tissue can be obtained by excision, and subjected to the same test. If you wish to carry on the line of diagnosis still further, the pus and the suspected tissue can be inoculated into a number of guinea-pigs, to see if they reproduce tuberculosis in these animals. A correct diagnosis is so urgently important in some cases that it will be your duty to undergo any amount of labor to arrive at a trustworthy decision.



Now, let us examine these cases. The first one is a little girl, nine years of age. The disease commenced two years ago, slowly, and without any known mechanical injury, and slowly increased. Three months ago she entered the hospital unable to walk, and the knee was swollen, tender, and very painful.

She was placed in bed and the knee immobilized by a weight-and-pulley extension. Under this treatment she steadily improved. After a time I gave her three increasing doses of Koch's lymph. No reaction followed, which would indicate, according to Koch, that the disease is not tuberculous, though I had at first supposed it to be so. The knee has almost returned to its natural size, and the soreness has nearly all disappeared. On the whole, the evidence indicates that this is not a true tuberculous case, but a simple inflammation originating in some slight forgotten injury, and gradually aggravated by constantly walking upon it, until it acquired a swelling strongly suggestive of tubercle.

Our second patient has advanced a step further. He is thirty-five years of age, and has had the disease three years. The early history of the case is substantially like that of the previous patient. The knee shows the same peculiar elastic swelling and "all-around" enlargement which we noticed in the other, but it is more advanced, for on the inner side, at about the middle of the condyle of the femur, you see a red prominence. This, when tested with the fingers, fluctuates. As the prominence is above the level of the synovial sac, it may be an independent tubercular abscess, originating outside the capsule; on the other hand, it may communicate with the sac. I will, therefore, open it with full antiseptic precautions. Having done so, you see that the contents are a moderate amount of thin serous pus, full of cheesy particles. The probe shows no prolongations of the cavity in any direction, and no communication with the cavity of the joint, nor do I find any denuded bone. The disease, therefore, may be outside of the capsule. This is confirmed by the fact that if I take hold of the foot and leg and press the head of the tibia against the condyles of the femur, at the same time making slight flexion and extension, so as to rub the synovial surfaces strongly together, there is no pain and no sense of rough surfaces rasping upon each other. There is hope, therefore, that this man may escape destruction of the joint. We shall wash out the abscess with corrosive sublimate water, fill it with a ten-per-cent. mixture of iodoform suspended in glycerin, and dress it antiseptically. We now return him to bed and put on a weight-and-pulley extension, and defer operation until we see what progress is made without it.

The third patient is the one in whom I shall be obliged to excise the knee, unless the disease has ruined the bones so far above and below the articulation that the cut surfaces cannot be brought together, in which case I shall have to finish by amputation above the joint. This possibility has to be borne in mind in many cases while planning the operation. This woman is twenty-nine years of age and is well nourished, although her knee is in a bad condition. It is immensely enlarged, though fair and white. The disease began gradually six years ago, and has slowly grown worse without known cause until the past two months, when she has become totally unable to bear any weight on the limb.

On looking at the member you perceive the same peculiar "all-around" swelling which you noted in both the other cases, only it is much greater in this patient. The swelling obliterates all hollows about the patella, and is greatest around the middle of the joint, tapering off somewhat abruptly to the thigh above and the leg below.

Much of the swelling is elastic as in the other cases, but in several places, even above and below the capsule of the joint, there are cavities that fluctuate under the test of the fingers, showing that there is pus here. If I take hold of the leg and push the tibia against the condyles of the femur, the patient winces with pain. If I continue the pressure, and slightly flex and extend the leg so as to rub the joint surfaces firmly together, the pain is violent. These facts, with the total absence of any syphilis or any true rheumatism, show pretty conclusively that we have a case of progressive tuberculosis affecting both the interior of the joint and the parts about it. If, now, I turn the patient on her side, you see that she has a moderate but distinct Pott's disease, causing a considerable bone projection in the lumbar region of the spine. This fact confirms in the strongest manner the diagnosis of tubercular disease.

As usual, this limb has been shaved clean of all fine hairs from the ankle to the hip, and then wrapped for twenty-four hours in gauze wet with corrosive sublimate wash, besides being thoroughly scrubbed with the same fluid. As the anæsthesia is now complete, I shall commence the incisions. Some surgeons prefer to raise a long anterior flap, in the form of the letter U; others make a double anterior flap by incisions in the form of the letter H. It is not essential which is selected, but as I must open and examine a lateral abscess, which extends well below the knee on the inner side, I shall in this case make the letter H incision. I shall first make the inner longitudinal cut, so as to lay open the abscess. It contains a thin curdy pus, and on inserting



the finger I feel an opening into the joint, and the presence of rough, carious bone. I now complete the incisions, making the transverse one just below the patella, and dividing the ligamentum patellæ, and the capsular ligament on both sides back nearly to the hamstring tendons. Now I raise the upper flap containing the patella; and on flexing the leg I find the crucial ligaments already destroyed, and there is no difficulty in thrusting the condyles out of the wound. I dissect off the tissues behind the femur, keeping the edge of the knife, of course, close upon the bone. Next I saw off the femur at the lowest sound point, which in this case is through the condyles, and repeat the dissection and sawing upon the tibia. The next step is very important. It consists in removing with the curette, the knife, and the scissors every bit of infected ligament and other tuberculous tissues, and curetting out with the utmost thoroughness all tuberculous masses and all suppurating surfaces and abscess-cavities, and rubbing them well with iodoform.

In the present case the cavities are multiple, though connected, and the searching, clipping, and curetting occupy, as you see, a tedious length of time, but on the thoroughness of this work largely depends the hope of success.

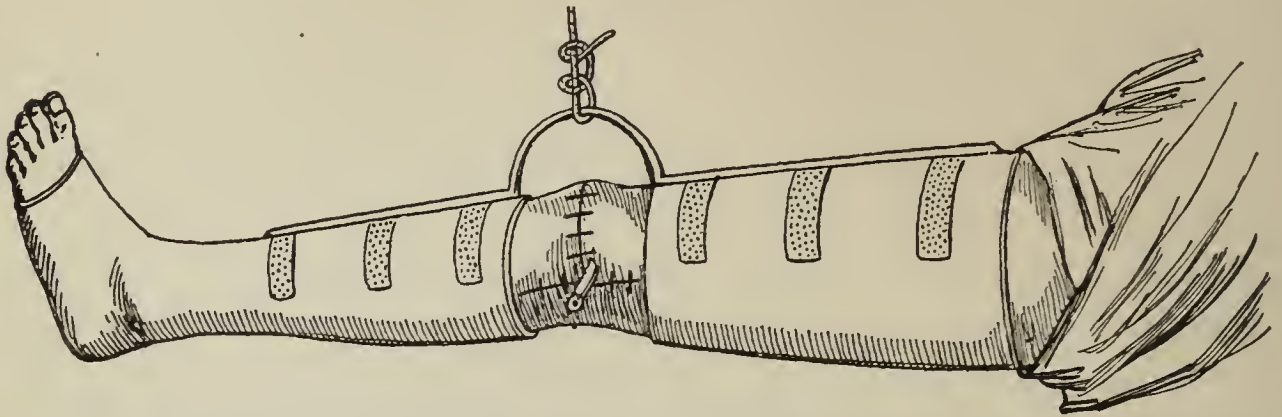
We now drill two holes, from front to back, in each bone, and fasten the bones together with plated copper wire. If the patella be diseased, as in this case, I remove it; if not, I leave it. The next step is to close the wound with sutures, put in drainage-tubes, and envelop the parts with a thick wrapping of antiseptic gauze. Finally, we apply a splint of one of several kinds.

If the tuberculosis has shown very little tendency to infect tissues outside the joint, so that you have a just confidence that your operation is not only thoroughly antiseptic, but also has thoroughly removed all tubercular tissue, you can use drainage-tubes of decalcified bone, which, being absorbed, will not require you to open the dressing for their removal, and then envelop the limb from foot to hip in a simple continuous plaster-of-Paris bandage, and leave it there several weeks, unless a rise of temperature occurs showing a need of redressing.

In the present case there were extensive suppurating fistulous channels in the soft parts, so that, in spite of our antiseptics and our vigorous curetting and clipping, we can have no certainty that the wound is absolutely sterilized. We shall, therefore, adopt the following plan: First, we shall apply a plaster-of-Paris roller to the foot and leg up to the vicinity of the wound, and another from the upper part of the wound to the hip, covering the whole thigh, having first enveloped the

seat of operation with antiseptic dressings. Next, we take a thin iron bar which has cross-bars of perforated tin riveted to it, and place it on the top of the limb in such a position that the tin strips lie transversely on the plaster, and the arch of the iron bar (*A*, Fig. 2) spans the space occupied by the wound (which for the sake of illustration is here shown without the dressings). We now envelop both segments

FIG. 2.



Plaster splint for excision of the knee, showing the iron bar and attached tin straps resting on the first layer of plaster bandage, the outer layer not yet being applied.

of the splint with additional plaster rollers, and thus firmly connect the whole into one splint. The dressings can now be changed whenever necessary without disturbing the position of the bones, and the limb may either lie on the bed or be suspended by a cord tied to the arch above mentioned. Many other splints are used, but this is among the best.

The mortality of excisions of the knee is much greater when done for traumatic injuries than in cases of chronic disease, so that in military surgery the operation is generally condemned; but the introduction of antiseptic methods has made so great an improvement that I do not despair of seeing it employed even on the field of battle, especially in pitched battles, which allow of more systematic preparation than sudden attacks.

In cases of disease, antiseptics have immensely improved the results. In the old surgery the mortality was from twenty to sixty-two per cent., while now it is less than ten per cent., and of the deaths actually occurring very few are due to the effects of the operation.



## CANCER OF CÆCUM; EXCISION; END-TO-END UNION; RECOVERY.

CLINICAL LECTURE DELIVERED AT THE NEW HAVEN HOSPITAL.

BY W. H. CARMALT, M.D.,

Professor of Surgery in the Medical Department of Yale University.

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GENTLEMEN,—The patient to whom I ask your attention to-day is a German, forty-four years of age, unmarried, of fairly good general condition, as you see, somewhat spare, but healthy in his expression and general make-up. He was admitted to the hospital a little over three weeks ago, with the following history: About three years ago he was troubled for about two months with pain in his abdomen,—worse after eating,—with some flatulence. The pain was not localized in any one particular point, but seemed to be general, without any especial tenderness on pressure. For this he was treated by remedies administered internally, apparently recovered, and was well for a year. He then had another attack similar in character, but a good deal more severe. For this he was treated by some New York physician for “inflammation of the bowels,” as he says. He states that the pain was rather more in the epigastric region on this occasion, somewhat lancinating in character, and worse after eating. The bowels were somewhat irregular, though never particularly painful in movement, but there was always some sense of distress within the abdomen. He apparently got well again. About a year ago he had another attack similar in character to the two preceding, but now with the pain extending from low down in the right iliac region up to the right side and across the epigastrium. This pain was severe, has been more or less continuous, and has grown worse up to the present time. His bowels are fairly regular and always relieved by mild cathartics if constipated. About six months ago some tenderness was noticed in the right iliac region, and three months ago he was told that there was “a gathering” there, which was poulticed; but nothing came of it, and

at about that time the present tumor was detected. There has been some flatulence, but nothing very marked.

On examination I find a firm tumor in the right iliac region just above Poupart's ligament, extending from about the anterior superior spinous process to the middle of the ligament. It is ovoid in shape, with its long axis parallel to the ligament. As I feel it through the abdominal parietes it is about the size of a goose-egg. It is fairly smooth on its surface, and the abdominal walls move easily over it. It is dull on percussion. The tumor itself appears to be attached deep down in the iliac fossa. It is slightly sensitive on pressure; it presents no point of fluctuation. The exact nature of this growth it is impossible to determine without an explorative incision.

A consultation of the attending staff has resulted in a somewhat divided opinion; some members regard it as malignant, without committing themselves further as to its point of origin, whether glandular or intestinal, others regard it positively as being connected with the cæcum, and others again think it is an enlargement of the appendix vermiformis. With regard to the latter point, I desire to call your attention to the fact that the tumor is situated entirely below what is known as McBurney's point, which point McBurney has formulated as indicative of acute appendicitis. This point is, as he defines it, an area to be covered by the end of the index finger, situated from an inch and a half to two inches from the anterior superior spinous process on a line drawn from that process to the umbilicus. Placing my finger, as you see, on that point, this tumor is entirely below it.

I shall now proceed to an explorative incision, and be guided by what I find as to the future steps of the operation. Preparatory to the operation his abdomen has been thoroughly scrubbed with soap-and-water, his pubic region and leg have been shaved, and the thigh, groin, abdomen, and side kept for the last six hours enveloped in a dressing saturated with a 1-1000 mercuric-bichloride solution. I also wish you to observe the precautions I take to prevent access of germs to the wound. As you see, I surround the whole operating-field with cloths wrung out in a solution of bichloride of the above strength, and these are to be constantly changed as they become soiled. The instruments, as you see, are taken from a carbolic-acid solution of two and a half per cent. strength, having previously been boiled for five minutes in water. Our hands have been washed and disinfected, and the same holds good for every attendant who handles an instrument or dressing coming in contact with the wound. The



silk sutures have all been boiled, and from the boiling water placed at once in absolute alcohol, from which they are taken at the moment of using.

I make an incision, as you see, over the tumor parallel to Poupart's ligament about five inches in length, and carry the dissection down through all the tissues, muscular and ligamentous, until I reach the peritoneum, which I now see at the bottom of the wound. I can feel that the tumor is within and not attached to the peritoneum. Opening this on a director along the full extent of the external incision, we come to the tumor itself, which projects into the peritoneal cavity, covered by the layer of visceral peritoneum. It presents itself as a fairly uniformly smooth growth of a dark-red color, upon the inner and upper surface of which I see a loop of small intestine, while another portion of the small intestine lying beneath this loop apparently is lost in the mass. The tumor is adherent to the abdominal wall below the line of Poupart's ligament and to the psoas and iliacus muscles. As I examine farther along the length of the tumor upward and outward, I find above it a section of intestine which I judge to be the large intestine from the longitudinal bands which course along its length. The surface of the tumor itself presents nothing upon which I can base an opinion as to its absolute nature; it is firm and uniform in consistence, dark red in color, not quite so florid as the small intestine by its side, and this may be pushed aside and away from it above and towards the median line.

I shall separate it below from the abdominal wall and endeavor to get behind and underneath it. I accomplish this with comparative facility, being obliged to use the edge of the knife but little, and I now have gotten fairly below it. As I do this I see that I elevate with it the section of small intestine to which I called your attention a few moments ago, and that it merges above into the section of the large intestine, also mentioned. I also see curled up around the lower and inner extremity of the tumor a convolution of cylindrical form which loses itself by one end in the mass; the other end lies on and attached to the mass, and, although this is some six or eight times as large as the normal appendix vermiformis, from its situation I am satisfied that it is that part, and that we have to do with a tumor of the cæcum, probably cancerous, involving the whole calibre of the gut, and including in it the ileo-cæcal valve. The section of small intestine to which I have before called your attention is very much hypertrophied, as is also this loop of small intestine which we saw presenting itself on the first opening of the abdomen. The section of intestine is the ileum. I find no general

enlargement of the mesenteric glands on passing my fingers into the abdomen, except a little nodule lying directly on the mass and firmly attached to it. I think I can enucleate all the diseased structure, and unite the small intestine below with the large intestine above after removing the mass entirely. I do this in preference to any attempt at intestinal anastomosis, as I thus remove the disease and have reason to hope for an entire recovery, while an intestinal anastomosis at best would be but a palliative operation. For this purpose I pass around the large and small intestine respectively an elastic ligature, to prevent the escape of any fæces at the time of dissection, first taking the precaution to empty the portion of gut between the tumor and point of ligation by stroking it between my fingers. I now separate all the attachments of the tumor to the abdominal parietes and the mesentery. In this latter manœuvre I get some hemorrhage by the division of the mesenteric vessels, but they are easily controlled by fine catgut ligatures; and you see, wherever the opportunity presents itself, I ligate them before division. In dissecting the upper portion of the tumor from the abdominal parietes I have less trouble from hemorrhage, and I now have the growth fairly isolated between the points of ligation of the gut above and below. I now divide the gut below first, and you see that there is no escape of fæces, the bowel having been emptied previously by the manœuvre described; but, in order to insure against any possible contamination, I shall get Dr. Russell to hold this end out of the abdominal wound, keeping the lips of the wound pressed around and below it, and, practising a similar manœuvre with the other end of the tumor, viz., the portion continuous with the large intestine, it is now entirely removed. I explore the parts below to see if there are any undetected glandular enlargements that would be better for removal. Finding none, we shall now proceed to the union of the divided extremities of the intestine, which I can approximate with little or no tension.

I want you to observe, gentlemen, that I am very careful to protect the intestines from cold, whenever unavoidably exposed, by keeping them always wrapped in warm cloths wrung out in an antiseptic solution. I bring as little of the intestine in contact with the external air as it is possible to do and at the same time to explore the abdomen sufficiently, and I return the intestine to the abdomen as soon as possible after the examination.

I shall now unite these extremities of the two intestines with two rows of stitches, one row uniting the two divided mucous membranes, placing them sufficiently close together to avoid escape of the contents



between the stitches. I begin at the deepest portion and put in one at a time until I get to the portion nearest to me, or the highest portion. Having completed that junction, I now unite the serous surfaces in a similar manner, making, however, the stitch known as Lembert's suture. This consists in picking up the fold of the serous, muscular, and submucous<sup>1</sup> tissues of the intestine above and below, but not including the edge of the incision. A series of these sutures I carry entirely around the intestine, and you see that the hypertrophy of the small intestine is sufficient to approximate in size to the calibre of the large intestine, which is a little contracted. So I do not have to make any folds or puckers or other devices to compensate for differences in calibre. Having united together the two divided ends of the intestine, I remove the elastic ligatures. I now flush out the abdominal cavity with sterilized warm water, which comes out perfectly clear and clean. There has been no escape of blood or anything else to soil the peritoneum. I now unite the abdominal parietes, passing for this purpose a row of deep sutures, inserting them from below at a little distance from the edge of the wound through the peritoneum, and out through the muscles and skin, uniting all structures in each stitch. This, as you see, brings the two serous surfaces in apposition, where they will unite by adhesive inflammation in a short time. In addition to this, I pass a row of continuous sutures through the external skin alone; and now, cleaning off the wound thoroughly with an antiseptic solution, I place over the wound thus closed a little of the sticky iodoform gauze, and fasten it in place with a couple of strips of adhesive plaster, placing over this again a quantity of antiseptic gauze. I bind this in position by a bandage of the same material passed in a figure-of-eight around the thigh and body, carrying it well above and well below to prevent contact of any external deleterious substance.

The man's condition when we get through is hardly different from what it was at the beginning. He will be placed in the recovery-room in a warm bed, and be kept as quiet as possible, the only medication to be morphine, given to control pain or restlessness. He will have no food at present.

*Eight Days Later.*—The case which you saw operated upon eight days ago I now present to you, with the very satisfactory report that there is very little to say. One is tempted to quote the language of the writer who states, "Blessed is the nation that has no history."

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<sup>1</sup> *Vide* Dr. Halstead, Bulletin of the Johns Hopkins Hospital, vol. ii. No. 10.

This patient has not given me a moment's anxiety so far as his symptomatology is concerned. For the first two days after the operation his temperature ranged between  $99^{\circ}$  and  $100.2^{\circ}$  F. His pulse was between 100 and 110. This latter feature was the most untoward of any one thing. On the third day his temperature did not rise above  $99.6^{\circ}$ , and his pulse only to 80. On the sixth day it did not get above  $99^{\circ}$ , and his pulse fell to 70. To-day his highest temperature has been  $99^{\circ}$ , and his pulse between 60 and 70. His medication has been Magendie's solution of morphine, four minims once in six hours for the first thirty-six hours. Then, as he seemed to be having a little nausea, I omitted it entirely, and gave him five grains of oxalate of cerium once in three hours for the following eighteen hours. His food consisted of two ounces of peptonized milk once in three hours, beginning on the morning after the operation and until the third day after the operation, when I alternated this with expressed beef juice, so that he got one ounce of each every alternate two hours. He has slept comfortably at night, and his only complaint has been for the last two days, that I wasn't giving him enough to eat, that he was hungry.

On the third day he complained of a desire to have a movement of his bowels, and Dr. Lawrence, on examination, found that his rectum contained some fæces, which he removed with his finger. On the next day he made more complaint, and examination showed a considerable mass in the rectum. He was then given an enema of hot water, which was followed at nine o'clock in the evening by a large movement. On the sixth day he had another movement entirely voluntary and normal in character, and on that day, as the patient complained of hunger, I gave him, in addition to his former diet, a soft boiled egg once in two hours. Yesterday he had two normal movements. This morning I removed all the stitches. The wound, you see, has united in its full extent. One stitch had two or three drops of pus around it. This stitch-wound I syringed out with a strong solution of peroxide of hydrogen.

[*Later History.*—A steady and continuous improvement followed. His pulse and temperature were normal, and he had movements of his bowels without interference. By the twelfth day, in addition to the food mentioned, he was given milk-toast. By the twenty-second day he was on ordinary hospital diet, and moving about the ward.

From the beginning his fæces were examined in order to determine when the stitches came away. On the sixth day two stitches were



found, and on the twelfth one more, making three all told, which are all that could be found. He was discharged cured on the twenty-sixth day after the operation.]

#### REPORT ON THE PATHOLOGICAL NATURE OF THE TUMOR.

The excised portion of intestine measured in the fresh state about eight inches in length, of which about five and a half inches were diseased, the line of separation between disease and apparent health being well defined. The diseased portion measured fairly uniformly seven inches in circumference along its whole length, and the section on cutting the mass open longitudinally was about three-fourths of an inch thick. The growth was symmetrical around the whole gut, and uniformly hard. The internal surface was uneven, with alternating clefts and prominences; the latter projecting free into the lumen, but in no wise interfering with passage of the intestinal contents.

The microscopic examination made by Dr. M. C. White, the pathologist of the hospital, proved the tumor to be a carcinoma adenomatosum, with a rather abundant development of fibrous connective tissue along with the epithelial cells. The arrangement of the latter suggested, in many places, the appearance of cylindrical cells.

# THE TREATMENT OF SIMPLE FRACTURE OF THE PATELLA BY SUTURE OF THE FRAGMENTS.

CLINICAL LECTURE DELIVERED AT BELLEVUE HOSPITAL, NEW YORK.

BY STEPHEN SMITH, M.D., LL.D.,

Professor of Clinical Surgery, University Medical College.

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GENTLEMEN,—The treatment of fracture of the patella by exposing the fragments, and uniting them by suture of wire or other material, must as yet be ranked among the novelties in practice, for the procedure has not received the sanction of the profession. Very few surgeons regard the operation with favor, while many condemn the practice as altogether unworthy of consideration. When first performed, in 1883, by Sir Joseph Lister, of London, it was looked upon rather as an audacious attempt to prove the immunity of wounds treated antiseptically to the dangers of suppuration than as improving our methods of treating this variety of fracture. Nor has the lapse of nearly a decade materially changed professional opinion. It is undoubtedly too early to determine the exact value of the operation, but there has been a gradual accumulation of evidence which is to form the basis of a correct judgment of its merits.

The objections to the immediate wiring of the fragments in ordinary cases of fracture of the patella are twofold. It is alleged, first, that it is attended with too much danger, and, second, that quite as good results can be obtained, without this risk, by simple methods of treatment. In regard to the first objection it may be stated that the danger to life is now scarcely to be taken into account. Wiring the fractured patella has been performed by surgeons of this hospital upward of one hundred times without a death traceable to the operation. Suppuration, usually superficial, is the only complication noticed, and in the twenty cases of my own it occurred once. That patient was in very poor condition, and the suppuration which took place in the external wound gradually extended to the thigh and leg. He recovered with a stiff knee, but useful limb. I have never known suppuration in the



knee-joint after this operation. The possibility of suppuration, though it so seldom occurs, is certainly a reasonable objection to the operation, and should have due weight with the surgeon. It should deter him from attempting the operation if he cannot command all the necessary antiseptic measures, and, if he operate, it should render him very attentive at every step of the procedure to the conditions which will render the wound aseptic.

The second objection cannot now be considered as well taken. The final results of treatment by apparatus and by the suture are largely in favor of the latter method. Consider first the time required in each case. Prof. Hamilton, who made a special study of non-operated cases, states that at the end of about four weeks the patient may be allowed to get up on crutches; in six or eight weeks the bond of union may be considered as completed, but the danger of rupture of the ligament is so great that for the next three or four months the patient should walk on crutches with the knee well supported by an inflexible splint, secured by straps and buckles. He also says that more or less loss of freedom in the motion of the joint, and of strength and stability in the limb, remains in the majority of cases for a long period of time, and often during life. According to this high authority, for six months, at least, the patient is incapacitated from using his limb, and its motions are likely to be impaired during life. Now, it is the united testimony of those who have had the most experience in treating this fracture by suture that the period of recovery is very much less. Mr. Ward, of London, treated three cases of fracture, one by apparatus and two by wiring; in the first the total time lost before resuming work was twenty-seven weeks, and in the two that had been wired, thirteen and eight weeks respectively. He further states that the first could not kneel before nine months, while the other two could do so six and five weeks after the operation.

Dr. Charles Phelps, one of the surgeons of this hospital, who has had a larger experience in this operation, probably, than any other person, states that the period of recovery is much less in the operated than in the non-operated cases; laboring men, on whom he has operated, have resumed work, he says, when patients treated by other methods are still in bed, or, at least, are on crutches. In two instances his patients resumed heavy work within six weeks of the operation, one in two months, and many others during the third month. These statements accord with my own experience.

Again, let us consider the kind of union which takes place as a result of the two methods of treatment. As a rule, in the non-operated

cases the union is by fibrous tissue, while in the operated cases it is by bone. When the union is by fibrous tissues two results may occur and must be anticipated. First, this bond of union is very liable to rupture during the first few months of the treatment. Hamilton says that his statistics show that this accident occurs with startling frequency, the ratio being twenty-five in one hundred and twenty-seven cases. When this accident happens he states that a majority of cases refuse to unite again, even by fibrous tissue, and the patients are consequently seriously maimed. Second, the tendency of this fibrous union is to lengthen with use, and thus, in many cases, the usefulness of the limb finally becomes seriously impaired. Very different is the result in operated cases, for here we have bony union almost without exception. Dr. Phelps reports as a definitive result in forty-two cases bony union in forty-one of the number. Now, bony union means a firm and unyielding patella, capable of enduring as much strain as if the bone had never been injured. In fact the patella has proved stronger at the line of union after wiring than in any other part. This has been made apparent in those cases where a refracture of the patella has occurred after suture. A case of this kind is now in the wards, in which a refracture of the patella was caused by a severe injury several years after it was united by wire. The line of fracture was found to be at least a quarter of an inch above the former line of union, which was plainly seen at the second operation, as the former wire was still in position.

From these statements you must infer that the method of treating fracture of the patella by suture is preferable to the treatment by apparatus in every respect except as to the possibility of suppuration which occasionally follows. If that complication could be eliminated, the operative method of treatment would evidently be the accepted plan in all cases. But can suppuration be prevented? Every day's experience proves that it can be prevented, at least in a dangerous form, and with so much certainty as to practically exclude it from consideration. Such prevention, of course, implies that the operator has all the necessary means at his command, and that he employs them properly.

From my own increasing experience and observation, I can but conclude that the operation of aseptic wiring or suturing of the fractured patella is preferable to treatment by apparatus in all cases where the surgeon has the requisite means for antiseptic cure. Professor Lister, who introduced the operation, gives an excellent rule for the guidance of the surgeon. He says, "No man is justified in performing such an operation unless he can say with a clear conscience that he



considers himself morally certain of avoiding the entrance of any septic mischief into the wound." While no one can assert that he positively knows that septic matter has not entered a wound, yet I believe that a surgeon may so conduct all the details of this operation that he is "morally certain" that he has avoided the entrance of "septic mischief" into the wound. The operation, under such circumstances, must, according to the highest authority, be legitimate.

With these statements in justification of the operation of suturing a fractured patella, I call your attention to the peculiarities of the case before us. This woman fell upon her left knee while walking in the street one week ago. The result was a fracture of the patella at its extreme upper part. Apparently not more than an eighth part of the entire bone was separated. It resembles, in fact, a rupture of the quadriceps tendon, except that a fragment of bone can be felt attached to the extremity of the tendon. There was considerable contusion of the parts, and effusion has taken place into the joint. It is very important to delay the operation until the immediate effects of the injury have subsided, but it is not necessary to wait for the absorption of effused fluids. Some of this effusion is blood, which will be immediately evacuated by incision, but which would be very slowly absorbed. My own operations have been delayed from four to six days after the accident.

The feature of this case which renders the operation of suturing the fracture preferable to the treatment by apparatus is the size of the upper fragment. It is so small as to be inaccessible to any external form of compression, by which it would be brought into contact with the lower fragment. It may be suggested that a subcutaneous ligature might be passed around the two fragments, passing through the ligamentum patella below and the tendon of the quadriceps above, and thus the fragments could be approximated; but this operation would not insure bony union, as it would not remove tissues interposed between the bones. The operation of directly suturing the fragments meets every condition, and will secure union by bone.

The first step in the operation was taken yesterday. The entire limb was thoroughly cleansed with soap and water and a brush, the parts about the knee being first wet with ether to dissolve oily matters. Then the limb was shaved from the middle of the leg to the middle of the thigh, to remove hairs and epidermic scales. Finally, the entire limb was wrapped with dry towels, rendered aseptic by being treated with a bichloride solution, and was not further exposed until the patient was placed upon the operating-table. We have here a per-

fectly clean and aseptic limb. Commencing at eight o'clock this morning she has taken an ounce of whiskey in four ounces of hot milk every two hours, until she had taken three ounces of whiskey and twenty-four ounces of milk, when she exhibited signs of slight intoxication. She has taken nothing during the last three hours. Her pulse is full and slow, her breathing natural, and she is indifferent to the operation. The purpose of giving the stimulant and milk in this manner is twofold: (1) the patient will now require comparatively little ether to secure complete anæsthesia, and (2) the liability to shock and collapse during and after the operation will be prevented. This preparatory treatment is the more important because the patient is fat and has a weak heart.

The immediate preparations for the operation are now in progress, and they are chiefly designed to protect the wound from "septic mischief," to which Lister alludes. These details you so constantly witness in this room that you must have become familiar with them, and I shall not notice them further. The operation is very simple. The first incision should be made transversely in the line of the centre of the separated fragments, and extend down on either side to the most prominent points of the condyles. This incision may lay open the joint. Black clots of blood first appear adherent to the fragments of bone. These we wash out with hot bichloride solution, and at the same time thoroughly irrigate the joint surfaces. We next proceed to expose the fractured surfaces by removing the adherent clots. This you will best effect with a sharp spoon or periosteal knife. This being accomplished, we notice shreds of fibrous tissue along the margins, which we carefully separate with forceps and scissors. These shreds are the torn capsule, and may prevent union if not removed.

The joint must now be disinfected by irrigation with the douche of bichloride, one to five thousand, and the fluid should be made to penetrate every recess of the articulation, but without using sponges or other materials. The process of wiring requires a drill and wire or silk for suture. Many forms of drill are in use, some simple, others complicated. Choose the simple form, such as Brainard's, but always keep it in good condition. Wire or silk may be employed for suture. Wire should be preferred when there is to be much tension by separation of the fragments, but if they fall readily together, silk will retain them in firm apposition. Pure silver makes the best wire, as it will bear close twisting without a break, and is non-irritating. A single central suture only is usually required.

If the bone be very firm the suture need not include the entire



thickness of the fragments. It should be entered from one-fourth to one-half inch from the upper margin, and emerge from the broken surface just at the lower margin. But if the bone be soft, as it often is at the time of the operation, it is much safer to pass the suture through the whole thickness of the fragments. In this case the drill should be entered as before, and passed directly through each fragment. To avoid any irritation of the joint surfaces by the wire, cut a groove in the under surface of each bone, into which the wire will sink. The latter method I shall adopt in this case, the bone being very soft, as appears on scraping the broken extremity.

There is sometimes delay in passing the wire along the track of the drill, but if the wire be of large size, and the end employed made straight, there need be no obstruction. The fragments may always be tilted so as to obtain a view of the opening and to enable the wire to pass with little or no bending. I cannot in this case perforate the upper fragment, as it is so small, and consequently I shall pass the wire through the tendon of the quadriceps above the fragment. The wire being passed, an assistant next firmly presses the fragments together and maintains them in actual contact, if possible, while the wire is being twisted. In twisting the wire do not cross the ends by drawing one around the other down at the points of emergence from the bone, but raise the two wires, and, seizing the ends with stout forceps, twist them down to the bones to such a degree of tightness that the fragments are brought and held firmly together. Now cut the wire half an inch from the bone, and with forceps turn the point of the cut wire upon itself, and then bend the twisted part down and bring it in the space between the fragments.

The suture having been applied, we again thoroughly irrigate the wound. The next step is its closure and dressing. Two points of interest are worthy of special notice. First, it is important to provide drainage at the most dependent part of the wound on either side. This may be effected by fenestrated rubber tubes, made aseptic, which penetrate sufficiently to allow the fluids to enter them, or a large horse-hair or catgut drain may be employed. Second, in closing the wound we shall first unite with catgut sutures the deep fibrous tissues. These sutures greatly strengthen and maintain the immediate coaptation of the fragments. The external wound is to be closed by the ordinary suture. The external dressings are the ordinary antiseptic materials, over which the gypsum bandage is applied from the ankle to the groin, so as to fix the joint immovably.

The most important feature in the subsequent management of the

case is the effort to secure good movement of the joint. It has been proved, in cases requiring a second operation, that, after wiring a fractured patella, adhesions exist in the joint, and chiefly about the fracture. It is necessary, therefore, to break up these adhesions as early as possible. If the case has done well the dressings may be cut down upon at the end of two weeks, the knee exposed, and by gentle efforts the patella may be moved laterally, care being taken to move both fragments together. The leg should also be flexed several times, no considerable strain, however, being made upon the patella. The same plaster dressing may be reapplied with tapes. This manipulation should be repeated every three or four days, gradually increasing the flexion. If, after four weeks, the stiffness of the joint be considerable, and the patient resist the efforts of flexion, an anæsthetic should be given, and free movement secured.

The patient need not be confined to bed during the early periods of treatment, but may be removed daily to a lounge or to chairs. As early as the third week he can begin to use crutches, the splint being firmly held in position by tapes or straps, if it has been cut down. Ordinarily the patient can begin to step on the floor at from the sixth to the eighth week, though care must be taken that the knee receive no strain. It is true that laboring men frequently resume active work as early as the sixth to the eighth week, but in one of my own cases, and in others that I have known, the strain has been such as to separate the bone in the line of the former fracture. It is, undoubtedly, better to give the union a longer time to consolidate.

[*Later Note.*—The woman operated upon before the class had no rise of temperature subsequently; the fenestræ were cut in the splint on the fifth day and the tubes removed; the dressing was removed on the eighteenth day, the patella moved laterally, and slight flexion of the leg made; this was repeated occasionally until the sixth week, when she left the hospital for her home with dressing applied, the patella being free and the flexion at the knee amounting to  $20^{\circ}$  without pain.]



WIRING FOR UNUNITED FRACTURE OF HUMERUS;  
PISTOL-SHOT WOUND OF BRAIN; ANEURISM  
OF THE AORTA TREATED BY THE COM-  
BINATION OF VALSALVA'S AND TUF-  
NELL'S METHODS, BY TEASING THE  
SAC-WALL WITH A SILVER  
PIN, ETC.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

BY J. A. WYETH, M.D.,

Professor of Surgery in the New York Polyclinic; Surgeon to Mt. Sinai Hospital;  
Consulting Surgeon to St. Elizabeth Hospital.

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THIS is the patient upon whom we wired the humerus eight weeks ago for an ununited fracture, which had occurred three months previously. This woman fell and broke her arm about two and one-half inches above the condyles, and the bones failed to unite. Occurring at this point, the fracture presents a danger of injury to the musculo-spiral nerve. The musculo-spiral nerve runs in a groove on the surface of the humerus, from the inner to the outer side posteriorly, and the projecting fragments not infrequently press upon and interfere with the function of this important nerve-trunk.

There are various methods of securing union in such ununited fractures. There is a conservative method which should be practised—or may be practised—in a number of cases. If your patient has a fracture of the arm or leg which has gone for ten or twelve weeks without union, under ether narcosis take hold of the bone above and below the break, twist the ends upon each other, and grind them together so as to break up the connective tissue and stimulate the production of callus; then put on a plaster-of-Paris bandage or some other fixed dressing. After that is done wait five or six weeks more. It does not matter about the joint; do not fear that it will become ankylosed unless the fracture extends into the capsule. As you see, the elbow-

joint of this patient is not at all stiff, and it has been immobilized for eight weeks.

If this does not succeed, the next conservative method is to wire the fragments together. With this method I am much pleased, since it will succeed in the great majority of cases. In this case the ends of the humerus overlapped each other. I exposed the bone by an incision, freshened the surfaces, and brought the two oblique ends in contact with each other. A hole was then drilled in each fragment three-quarters of an inch from the freshened ends, entirely through the bone, and through this was passed a very large, soft, silver-wire suture. The ends of the bone were brought in close apposition, the wire twisted, and the ends cut short. The wire is supposed to be left in indefinitely. Any kind of drill is good enough. The old-fashioned shoemaker's awl will do if nothing better can be obtained. It is better to use an instrument that pushes its way through by a half-turn to right and left, in preference to one that must be turned round and round as one bores with a gimlet.

This wound has not seen the light of day for eight weeks, as the dressing has not been changed since the operation. You will see by inspecting the dressings, which we have just removed, there is not the slightest suggestion of suppuration or decomposition.

It seems to me that I can detect a little motion here, although I do not want to press too hard to find it: there is a little yielding where the bones were wired together. In view of this, I shall not disturb it until the bone is entirely united. We will put on a very light plaster-of-Paris bandage, and, although the arm and elbow have been perfectly immobilized for eight weeks, I shall keep it encased for four or five weeks longer. Before applying this dressing, I shall make passive motion at the elbow, taking care to hold the fragments perfectly motionless while this is being done. In applying this bandage, we will put it on quite snug, as there is no risk from swelling.

[*Later Note.*—At the expiration of four weeks the dressing was removed, and solid union was found to exist. The patient was discharged cured.]

#### PISTOL-SHOT WOUND OF THE BRAIN.

This boy, eight years of age, on the 6th day of October last, received a pistol-shot wound of the brain, the ball entering about one-half inch above the middle of the right eyebrow. The wound was made by a twenty-two-calibre ball from a pistol or parlor-rifle. The ball passed through the frontal bone, and disappeared in the brain-



substance. No effort was made to probe for the missile. Having perforated the skull, the brain offers practically no resistance, and the bullet, without much doubt, is lodged at the back of the skull. In certain cases of wounds of large calibre, and where pieces of bone have been carried in with other foreign bodies, you are justified in probing the wound and removing all foreign bodies. In this case none of these conditions prevailed, and it did not seem justifiable. The wound was cleansed antiseptically, several particles of loose bone lying near the opening removed, and a little catgut drain inserted. Five days after the injury the dressing was changed, and the wound irrigated with Thiersch's solution. This was repeated every five or six days until it healed up. He remained in the hospital six weeks longer than was necessary, during which time he was kept perfectly quiet, and after that his mother took good care of him for four weeks more at home, so that the ball could become firmly encysted. Balls in brain-tissue are liable to move about, and such patients should be kept quiet long enough to allow connective tissue to be developed around the missile and render it immovable. This boy is doing very well. He is wonderfully bright, and there is nothing abnormal about him.

#### ANEURISM OF THE ASCENDING SEGMENT OF THE ARCH OF THE AORTA.

The next patient is suffering from aneurism of the aorta. He gives a history of syphilis dating back some eight or ten years. The period of treatment, as he gives it, was short, having taken mercury only for about six months. This is not long enough to destroy the virus of syphilis. I make it a rule to keep patients for two years under close observation and active treatment.

Without going into a discussion of this disease, I will say that approximately the treatment of syphilis may be divided into four quarters of six months each. The first six months mercury, chiefly in the form of the protiodide day in and day out, is indicated; the second quarter, potassium iodide for one week of each month and the protiodide for the other three weeks; the third quarter, potassium iodide for three weeks and mercury one week of each month; and the last six months, potassium iodide all the time. Of course you will vary this treatment and regulate the dosage in each particular case. It is only the outline of what I have found to be a good and safe rule of treatment in this disease. It is all-important to keep up the nutrition of your patient, and the alimentation is as essential as a careful medicinal *régime*.

It is safe to say that if this man had been treated continuously for

two years he would not have developed a chronic arteriitis with atheromatous degeneration and aneurism as a result.

It is known to be a clinical fact that arteries give way and aneurisms occur in those portions of the arterial system subjected to the greatest strain, either by the force of the blood in its circulation or to injury from without.

Just where the volume of blood, shot out of the left ventricle with each systole, strikes the upper surface of the ascending segment of the arch of the aorta with greatest violence this aneurism has developed. In fact the sinus magnus of the aorta is due to this strain upon the healthy vessel. The sacculation in this instance has continued until now there is a large mass pressing upon the innominate artery so heavily that pulsation has ceased in the right carotid and can only be very slightly made out in the right radial; at times it entirely ceases here.

The bulging noticed in the right side of the neck is due to the greatly-distended internal jugular vein, which cannot empty itself by reason of the pressure on the right vena innominata. The right arm is also swollen from venous stasis. The tumor projects through the chest-wall, having whetted away or eroded the second and third ribs and the side of the sternum.

Our diagnosis as to location of the tumor rests upon, (1) the frequency of aneurism of the arch and of its ascending segment; (2) the fact that the swelling is wholly within the chest, and has not appeared at the root of the neck (aneurism of the innominate rises into the neck, as a rule, early in its development); and (3) that neither recurrent laryngeal nerve is pressed upon and the trachea is free. (In innominate and right subclavian aneurism the right recurrent, as a rule, suffers from pressure. In aneurism of the transverse arch the left recurrent nerve is apt to be affected, and the tumor rests upon and interferes with the trachea.)

The treatment of this patient consists in absolute rest in bed in sitting and recumbent position, large doses of iodide of potassium (now three hundred and sixty grains a day), generous diet with the minimum of liquids. As he is full-blooded, with bounding and distended pulse, he is bled from eight to fifteen ounces every week.

Our hope is to consolidate the tumor by this method and prevent both rupture of the sac and any fatal pressure upon vital organs. So far as the influence of deligation of the carotid and subclavian arteries is concerned, that indication does not exist here, since these vessels are practically occluded by pressure.



[Ten days later a long silver pin was introduced and the inner surface of the sac-wall scratched, in order to expedite the formation of clot. Twelve silver hare-lip pins two inches in length were stuck through the skin over the tumor and carried their entire length into the cavity of the aneurism. They were allowed to remain for twelve hours. The consolidations as a result of this treatment were well marked, and it was repeated in three weeks. The aneurism gradually decreased in size, became firm, the symptoms of pressure on adjacent organs disappeared almost entirely, and the patient left for his home in Ohio, greatly relieved. He was directed to continue the treatment of rest in bed, with occasional administration of iodide of potassium in large doses for at least one year.]

## FOUR CONGENITAL TUMORS OF THE HEAD AND SPINE, ALL SUBMITTED TO OPERATION.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON MEDICAL COLLEGE HOSPITAL.<sup>1</sup>

BY W. W. KEEN, M.D.,

Professor of the Principles of Surgery in the Jefferson Medical College.

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GENTLEMEN,—I shall have the pleasure of considering with you to-day four tumors which illustrate remarkably well some more or less allied forms of imperfect development, and some recent discoveries in embryology. The first three are associated with imperfect development of the posterior or neural arches of the vertebræ, and the fourth is a double anomaly, illustrating a very rare form of tumor arising from an obsolete canal, with another from developmental inversion of the skin.

The first and third I shall operate on before you ; the second was a case in my private practice operated on in this hospital, and the fourth was operated on at St. Agnes's Hospital.

The first is a case of meningocele, in which the posterior arch of the occipital vertebra (for you know this bone is a vertebra) is imperfect and has an aperture through which the meninges of the brain and possibly some of the brain-tissue itself is protruding. The second and third cases are spinæ bifidæ, in which again the posterior or neural arches have failed to unite, and hence there has been a protrusion of the membranes of the spinal cord together with some nerve-filaments in one case. These three are all closely allied. The fourth is a tumor situated in front of and not behind the coccyx, and while in being congenital and in its position at the end of the vertebral column it is allied to the other tumors, yet its origin is wholly different. Adjacent to it is developed a dermoid cyst.

All of these tumors have one point in common : that they are congenital and the result of faulty development in intra-uterine life, and

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<sup>1</sup> The last case was actually operated on after the clinical lecture, but is included to complete the series.



in addition to this they are tumors which have only lately been attacked in an operative way with success.

CASE I.—MENINGOCELE; REMOVAL BY EXCISION; CURE.

These tumors are very rare. Ross states that a prominent London obstetrician in twenty-four years of practice never saw a case, Gibbs in five thousand births saw only one, and Winckel in twelve thousand saw only three. Of this kind of tumor there are three forms. First, a meningocele, a tumor formed by the meninges of the brain alone, and containing fluid which is extra-cerebral and not from the ventricles. It is the rarest form, and is thought by some to be a retrograde change from the next form. The second form is an encephalocele, a tumor in which there is protrusion through the bony aperture of brain-substance as well as the meninges. The third form, and unfortunately the most frequent and the most fatal, is hydrencephalocele, in which both the meninges and brain-substance protrude in a mass, usually of large size, and the protruding cerebral tissues are distended with the cerebro-spinal fluid of the ventricles, a sort of extra-cranial, internal hydrocephalus. These tumors most commonly occupy the middle line, and are especially frequent in the region of the forehead and occiput. Thus, Houel has collected ninety-three cases, in which sixty-three were occipital, sixteen fronto-nasal, and the remaining nine at the junction of the cranial bones at the sides and base of the skull. The most probable view of their origin is that they arise from intra-uterine hydrocephalus. They give rise not uncommonly to errors of diagnosis, having been mistaken for vascular growths, sebaceous cysts, herniæ of the superior longitudinal sinus, abscesses, etc. You can readily see that, if by an error of diagnosis they are operated on without a knowledge of what the operator will probably encounter, he may find himself in a most awkward position and be quite at a loss what to do.

A few points will probably enable you to diagnosticate them more accurately. They are always congenital, as a rule median, and most frequent in the occipital or fronto-nasal regions. More commonly they differ in shape from our present case, being more or less rounded. Not uncommonly, as in this case, the defect in the skull can be felt, and very frequently the pulsation of the brain is perceptible. If this be the case, violent expiratory efforts, such as crying, sneezing, laughing, etc., will produce greater tenseness of the tumor. A meningocele and a hydrencephalocele are generally translucent; whereas an encephalocele, having more dense brain-substance in it, is usually opaque, and is

more apt to have a wide base, instead of being pedunculated as the other forms not uncommonly are.

The prognosis is very grave. Most such children, especially if the case be severe, die at or soon after birth. Should the child live, the tumor generally grows and finally bursts, an accident which usually causes speedy death. In a few cases the aperture will gradually close, just as the normal fontanelle closes, the communication with the brain is finally cut off, and spontaneous recovery may ensue.

In the way of treatment often little can be done, and in the graver cases nothing save simple protection. Where the tumor is comparatively small, and especially if it is growing and threatens rupture, the great improvement in cerebral surgery during the last few years should lead us to do as I propose to do in this case,—namely, to operate with a view to radical cure. Of course in such a case as this you would use all the ordinary precautions, such as shaving, prior disinfection, etc., which you have seen me use in cases of trephining and operations on the brain itself. Not knowing in this case, also, whether certainly we have to deal with brain-tissue in the interior of the tumor, or whether, as seems likely from the incompressibility of the tumor, its want of translucence, the slight pulsation, and the slight influence of crying, we have to deal with a retrograde encephalocele with no communication, or only a slight one, with the brain, I shall be ready either simply to suture the parts together or excise any protruding cerebral tissue that I may find. I propose to attempt the closure of the bony opening with a piece of decalcified ox-bone, if, in the course of the operation, I find it a suitable procedure.

The patient is a boy three years of age, sent to the Jefferson College Hospital by Dr. Coplin, March 31, 1891. He is one of four children, all of whom are otherwise healthy. At birth he had a lump on the posterior aspect of the skull about as large as a hickory-nut. Now you will observe that it has grown very much larger, measuring one and three-quarter inches across the base and protruding one and three-quarter inches from the skull. (See Fig. 1.) At first it was very painful, but now it can be handled with impunity. It is situated at the posterior fontanelle, which is open, and it moves with every beat of the heart. The child's intelligence is good.

I shall now proceed to do an exploratory operation with a view to the removal of this tumor, by an elliptical incision near the base of the tumor. I have dissected back the flaps until I reach the pedicle, which, to my gratification, I find is only about as large as my little finger, though I find the opening in the skull to be one and one-quar-



ter inches across. I do not find any cerebral tissue in the pedicle, so far as sight and touch indicate. I shall therefore ligate it in three sections and close the wound as quickly as possible. Having ligated it and excised the tumor, I next insert a piece of decalcified ox-bone with a view to the possible occlusion of the gap in the bone, though I confess I have not much hope of success in this, as fortunately the edges of the opening in the skull have not been exposed. It will, however, do no harm to make the attempt. Next the flaps are sewn together at very close intervals. I have used no drainage. You observe that the pedicle of the tumor is quite spongy, and that some drops of apparently cerebro-spinal fluid oozed from it. Although I have no fear of the escape of the fluid, any more than in the last case I operated on before you a little while ago, yet at the same time I want to arrest the escape of the fluid if possible. The most careful antiseptic dressings will be applied.

**After-History of the Case.**—For four days after the operation the wound was dressed daily on account of the abundant oozing of cerebro-spinal fluid. It was then painted with aristol collodion, which arrested the flow except at the posterior part of the wound. Two days later a drop or two of pus exuded from the posterior part of the wound.

On the eighth day the child had an attack of earache, and his temperature rose to  $100.2^{\circ}$  F., but quickly subsided on syringing out the ear. On the 13th day, when he had a little intestinal disturbance, the temperature rose to  $99.2^{\circ}$  and a very small amount of pus was discharged from the lower part of the wound. At the end of three weeks, as the child was a little restless, I gave him some ether and re-opened the wound. I found only a small fragment of the decalcified bone remaining. The stump which had been ligated was a yellowish, cheesy mass, which was well scraped and the wound swabbed out with pure carbolic acid. There was no rise of temperature after

FIG. 1.



CASE I.—Meningocele.

the operation, and the restlessness, which had been quite marked for several days, entirely disappeared. The wound was packed with gauze and allowed to granulate.

The child left the hospital on the twenty-eighth day, and was then cared for by Dr. Coplin until entire healing took place, at the end of eight weeks after the operation.

Dr. Coplin carefully examined the tumor and reported as follows: "The skin covering the tumor was thin and highly elastic near the pedicle, while beneath it was a thin layer of fat. The integument covering the posterior distal extremity of the growth was thickened and firmly attached to the body of the tissues below without the intervention of any fat whatever. The base and body of the cyst were covered with a moderately thick coat of hair, while the posterior surface was smooth, from the constant rubbing, as shown by the presence of abundance of hair-follicles on section. Immediately beneath the skin there was a layer of white, fibrous tissue, composed apparently of organized embryonic or inflammatory tissue, some points showing a recent, small round-celled exudate. This fibrous layer contained nerve-fibres in small numbers. In the centre of the growth (or cyst) was a small cavity, rod-shaped in outline, about three-quarters of an inch in length and one-quarter of an inch in its transverse diameter. This was filled with a clear, serous fluid of about the consistency of egg albumen, possibly not quite so dense, and existing evidently under pressure, for when opened it poured out very much as does a tense hygroma. The wall of this cavity was lined by a layer of flattened connective-tissue cells."

Evidently the case was one of retrograde meningocele in which the communication with the brain had closed and yet the tumor was growing in size.

#### CASE II.—CERVICAL SPINA BIFIDA; REMOVAL; OPERATIVE RECOVERY; DEATH FROM ENTERITIS.

The case I shall now relate to you is allied to the next one I shall operate on, as well as to the preceding case. She was a hearty, double-chinned baby, four months of age. When born a small lump was noticed on the back of the neck. This grew, slowly at first, but later quite rapidly. She was admitted as a private patient to the Jefferson Hospital, April 15, 1890. The tumor was nine inches in circumference, the pedicle being slightly smaller than the body, and corresponded to the three or four middle cervical vertebræ. (See Fig. 2.) It was translucent, and by transmitted light the cord was evidently



absent, and there was no evidence of nerve-roots. It became quite tense when the child cried, and pressure on the tumor and on the anterior fontanelle reciprocally was felt at both points.

As there was danger of rupture, operation was recommended and readily assented to, and I operated on April 17, 1890. A vertical elliptical incision was made, the sides of the ellipse corresponding to the line where the thin skin over the centre of the tumor changed to the thick skin around the base. Care was taken not to open the sac. With considerable difficulty the flaps were dissected away, the strong adhesions to the sac being cut through until the tumor was entirely loose excepting its pedicle. Long silk sutures were now passed through the lateral flaps of skin. These were so long that they could lie loosely, the upper six in loops above the base and the lower six below it. A silk ligature was next tied tightly around the neck of the sac, and the entire sac rapidly cut away just posterior to the ligature. The sutures in the skin were now tied as rapidly as possible, and a sublimate dressing applied, with a binder's board splint at the back of the head and neck to secure rest as far as possible.

*April 18, First Day.*—The wound was dressed and looked excellently. The temperature rose at four P.M. to  $104.4^{\circ}$ . It was now learned for the first time that the child's bowels had been seriously disturbed for two days before the operation. The bowels were opened frequently, and the rise of temperature was probably due to this. The child was placed upon peptonized milk in addition to what it took from the mother, and small doses of pepsin were given each time it nursed. In addition to this astringents and minute doses of opium were given.

*April 21, Fourth Day.*—The temperature continued high until last evening, when it fell to  $100.4^{\circ}$ . The wound looked well, but a little cerebro-spinal fluid escaped.

*April 22, Fifth Day.*—The temperature fell to-day to the normal. A sudden gush of fluid took place in the afternoon, wetting the dressing, night-dress, and pillow. This was accompanied with dilatation of

FIG. 2.



CASE II.—Cervical spina bifida.

the pupils and some contraction and twitching of the fingers, especially the thumb.

*April 23, Sixth Day.*—The stitches had torn out and the wound gaped open, but looked very well, there being no suppuration. Six stitches were introduced, uniting the edges very well. Renewed disturbance of the bowels took place, however, and the temperature rose to  $102.4^{\circ}$ .

*May 18.*—The stitches gradually cut through again, leaving the wound gaping about half an inch at its lowest part. The disturbance of the bowels continued up to the tenth day, with the temperature fluctuating between  $101^{\circ}$  and  $104^{\circ}$ . The dressing had to be changed daily, and sometimes twice a day, on account of the free escape of cerebro-spinal fluid. This, however, seemed to do no harm. About the 15th day the temperature fell to  $100^{\circ}$ , and continued so for ten days. By this time the wound had entirely closed.

On the twenty-eighth day the temperature again rose to  $104.4^{\circ}$  with renewed disturbance of the bowels, and the child died, exhausted, on the thirty-first day after the operation, the wound having been healed for a week. No post-mortem could be obtained. Examination of the sac showed that it consisted simply of membranes without any nerve-roots within it.

Had I been informed of the disturbed condition of the bowels I should have postponed the operation, but I was not made aware of it until the diarrhoea after the operation called attention to it. In this respect it resembles the next case, in which there was also an undisclosed digestive disturbance. I cannot but think that the lives of both children were sacrificed by the unintentional concealment of this important fact. Both of them were practically well from the operation and died as a result of the digestive disturbance. The continued and free escape of cerebro-spinal fluid is worthy of note. The number of operations on the brain has of late been very large, and in a great many the escape of cerebro-spinal fluid has been very free, as also in numerous cases of operations on the spine. Formerly such an escape was deemed to be either dangerous or, possibly, necessarily fatal; but a larger experience has shown that unless the loss has been so sudden as to cause convulsions there is no especial danger connected with the free escape of cerebro-spinal fluid. Had this child not died from the enteritis, there is every reason to believe that she would have recovered from the defect; not, of course, that the bony defect would have been made good, but the removal of the thin skin over the central portion of the tumor and the thorough union of the thick skin around the base



over the defect would have protected her, I believe, from all harm or probable accident, and she might have lived to an ordinary adult age.

The treatment of such cases by iodide of potassium and iodine dissolved in glycerin was introduced and has been successfully employed by Morton in England and others elsewhere with very fair results; but it does not seem to me to be so rational a form of treatment as that by operation, and it also does not seem to be without danger. By our modern surgical methods we can cope with cerebral and spinal defects so successfully that I believe the knife will replace attempts at medication, saving in such cases as may be unsuited to operative interference.

CASE III.—SACRAL SPINA BIFIDA; EXCISION; OPERATIVE RECOVERY; DEATH FROM ENTERITIS.

The region of the sacrum and coccyx is apparently a favorite one for the development of congenital tumors. They were all formerly classed under the name of "sacro-coccygeal tumors," and, curiously enough, are developed much more frequently in girls than in boys, for Moltke has collected fifty-eight cases, forty-four being in girls and but fourteen in boys. Recent investigations have thrown a great deal of light on their pathology, and they may now be divided into three classes.

First, a more or less complete development of a supernumerary foetus. This may consist of the most rudimentary foetal development, and from this pass through all grades up to an almost complete attached foetus. Sometimes there will be but the stump of a single member, such as a leg or an arm, and sometimes an almost complete second being.

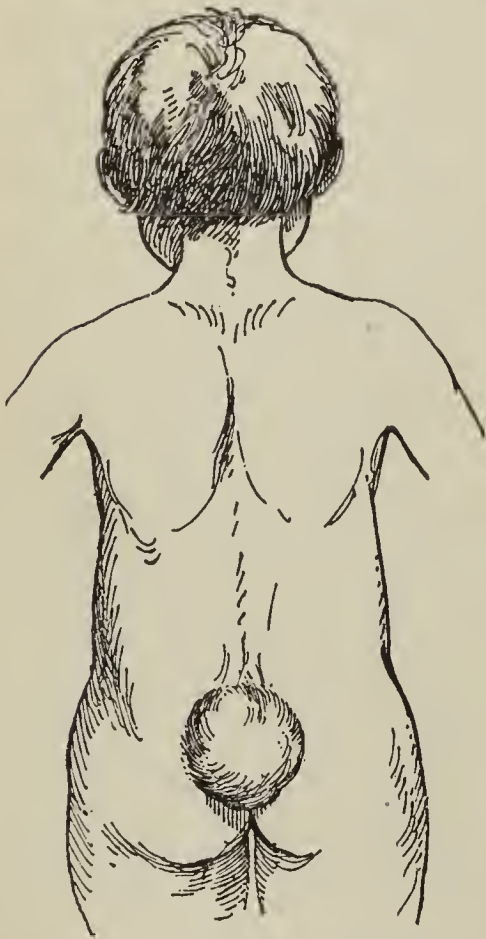
Second, a spina bifida proper, of which our present case is probably an example.

Third, directly at the end of the spinal column, in the region of the coccyx, a tumor may develop in either one of two positions. If posterior to the end of the spinal column it is most apt to be a spina bifida and should be placed in the second class, and not, as it often is, among the teratomata or congenital monstrosities, such as the first class or attached foetuses are. If anterior to the coccyx they form a still more curious group, which were formerly thought to be a cystic degeneration of Luschka's gland. Of this our fourth case is an excellent example, with a curious added complication, of which more anon.

The present case is a little girl of six years. Her mother is living, but her father died of phthisis. At birth there was a small tumor over the middle of the sacrum. This has gradually grown larger, but

of late with marked rapidity, so that now it measures both vertically and transversely five inches, and is about two inches above the level of the skin. (See Fig. 3.) It is neither tender nor painful. By palpation I can feel obscurely an irregularity, which I judge to be of the bone, although most of the mass seems to be rather dense fibro-fatty tissue, which makes it difficult to be certain of the condition of the spine. There have been no phenomena referred to the legs. Examination by the rectum shows that the anterior surface of the sacrum is normal. The child has entire inability to control the bladder, and has also a beginning talipes equino-varus of the right foot. Not uncommonly you will find such deformities as club-foot, cleft palate, etc., combined with spina bifida. In other words, the same obscure cause which has led to the defective development of the spine has led to defective development elsewhere.

FIG. 3.



CASE III.—Sacral spina bifida.

Inasmuch as this tumor is growing and threatens the child's comfort, and probably hereafter its life, I have determined to operate in your presence immediately by a small elliptical incision on each side of the middle line, vertically. I next dissect back the flaps from the fibro-fatty matter. I must now separate this mass laterally from the sacrum, step by step, and I soon come upon a funnel-shaped pedicle one and one-fourth inches long and an inch and a half wide, which evidently consists of the membranes of the spinal cord protruding through the opening in the back of the sacrum, as I had suspected. This funnel-like pedicle is in the middle line, nearly circular, and with quite thick walls. I find that the left side of the sacrum is elevated an inch above, that is posterior to the right side. Having now dissected the tumor entirely loose, excepting the pedicle, I make a small opening in this, when, as you see, the cerebro-spinal fluid begins to escape. Beginning at this small opening I cut loose the entire tumor, leaving enough of the membrane at each side to be approximated by sutures. In doing this a number of nerve-filaments are seen attached to the walls of the sac, each one of which is cut through. The edges of the membranes are now approximated with catgut and the skin with silk,



a drainage-tube having been introduced just underneath the flaps of skin. The bleeding has been but moderate, no ligatures being needed. I next apply a sublimate dressing. In consequence especially of the child's inability to control the bladder, I shall direct that she lie as much as possible on her face, and I shall also give twenty drops of paregoric three times a day for the first three days to prevent any infection by the fæces.

**After History.**—In ten days the wound was almost well. The drainage-tube was removed at the end of forty-eight hours. In spite of the greatest care, slight infection took place,—curiously enough, at the upper part of the wound,—with the discharge of a small amount of pus, but the wound was granulating and doing admirably. On the tenth day a sudden attack of enteritis, to which I now learned for the first time that she had been quite subject, set in, with twelve movements of the bowels and a rise of temperature to  $102.6^{\circ}$ . Two days later the temperature fell to subnormal, and fluctuated between  $97^{\circ}$  and  $98^{\circ}$  until her death, sixteen days after the operation. The diarrhœa and vomiting were constant, and the child wasted away and died of exhaustion. The wound in the membranes of the cord had healed by first intention, as well as the lower part of the outer wound. No spinal symptoms whatever were developed. Unfortunately, no autopsy could be obtained.

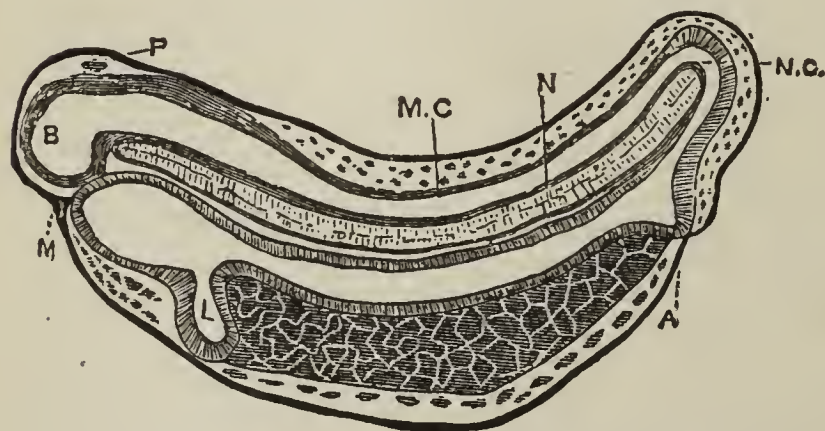
CASE IV.—A DOUBLE COCCYGEAL TUMOR, CONSISTING OF A  
TUMOR OF THE POST-ANAL GUT AND A DERMOID  
CYST; OPERATION; RECOVERY.

This case is so curious and so allied to those I have already brought before you that I propose to relate it to you in connection with the others, although it was operated on elsewhere.

In considering the last case, I mentioned to you that the coccygeal tumors which were posterior to the coccyx were really cases of spina bifida. Those which lie anterior to the coccyx belong to a totally different class, and their history and origin have only recently been well ascertained. The variety of congenital tumors known as "teratomata" usually arise in regions where the three original blastodermic layers are brought into communication with each other at some time in the development of the ovum, but this communication is only temporary. This temporary union is usually effected by canals to which Bland Sutton has given the name of "obsolete canals,"—that is to say, "canals which in the ancestors of mammals were functional, but which reappear in existing forms in obedience to the great law of heredity so ably

enunciated by Darwin." Examples of these are found in connection with the canal from the infundibulum to the mouth, the branchial clefts, the various genital tubes and ducts, and finally the remarkable canal which connects the central canal of the spinal cord with the alimentary canal. This is known as the "neurenteric canal or passage." In 1871, Kowalevsky drew attention to this curious temporary canal or passage. It runs from the central canal of the spinal cord around the posterior or caudal end of the notochord, and passes into the section of the alimentary canal termed the post-anal gut, because it lies posterior to the anus. The communication, however, is usually soon obliterated. Previous to this discovery the alimentary canal was thought to terminate in the anus, but Kowalevsky showed that in the embryos of amphioxus, ascidians, plagiostomi, and teleostei it is prolonged for some distance beyond this point into the tail. Later, the anal involution of the skin appears, and the gut posterior to the anus usually atrophies. The relation of the neurenteric passage to the central canal of the cord and the post-anal gut is shown in Fig. 4, copied from Goette's figure of *bombinator igneus*. At first it was

FIG. 4.



LONGITUDINAL SECTION OF AN EMBRYO OF *BOMBINATOR IGNEUS*.—*B*, brain; *P*, pineal gland; *M.C.*, spinal canal; *N*, notochord; *M*, mouth; *L*, liver; *A*, anus; *N.C.*, neurenteric canal. (After Goette.)

thought that this singular arrangement was peculiar to the ichthyopsida, but later researches go to show that it is an extremely generalized condition. Since attention has been called to the matter, a post-anal gut has been found in animals, from the amphioxus up to and including man (Sutton).

The post-anal gut, it will be observed, therefore, normally exists, though really atrophied, and the neurenteric passage is an obsolete canal, which is cut off early in intra-uterine life from the central canal of the spinal cord, just as the tunica vaginalis of the testis is cut off from the peritoneal cavity. But under exceptional circumstances the mucous membrane and glands which line this post-anal gut and neurenteric passage persist and may develop into a tumor consisting of multiple cysts. These have been long known to surgeons, but prior to the discovery of the post-anal gut and the neurenteric passage they were thought to be due to a cystic development of Luschka's gland, or



the "coccygeal glomerulus." This is a small lobulated body about two millimetres in diameter and attached to the coccyx by a pedicle formed by the middle coccygeal artery and a sympathetic-nerve filament.

The origin of such a tumor from obliterated gut lined with intestinal mucous membrane explains to you how you can find in such a cystic tumor mucous membrane, follicles of Lieberkühn with non-striated muscular tissue, and solitary follicles. These solitary follicles are very abundant near the body openings, as, for instance, in the urethra and the mucous membrane of the nose and the anus. In some of these tumors even "gut has been found in them, agreeing in every respect with normally-developed intestine." These so-called teratomata should, therefore, be regarded no longer as such, but should be classed with the cystomata.<sup>1</sup>

You will observe that these tumors lie anterior to the coccyx, as in our present case. This is readily determined by rectal examination. Moreover, in this case the pressure on the coccyx had so far displaced this bone that it pointed distinctly backward, and had become a serious annoyance to the patient, rendering her unable to sit with comfort. I therefore excised this bone, and then proceeded to deal with the tumor itself as the case required. The tumor was not growing, was not malignant, and was not in itself a serious discomfort or danger. Therefore, as its removal seemed unnecessary during the operation, I let it alone. But during the operation I found an unexpected complication. You are familiar with the little dimple which always exists just behind the anus and is called the "post-anal dimple." This is a point at which an involution of the skin sometimes takes place and gives rise to a cyst in which the sebaceous matter of the inverted skin accumulates, and is often supposed to be an ordinary sebaceous tumor. Its real origin is, however, as stated above. I have operated on three of these small tumors in the past twenty years by simple incision, scraping, disinfection, and packing. Sometimes, as in this case, however, there are developed not only the sebaceous matter of the skin glands, but also hair and rudimentary teeth; all of them, you observe, cutaneous structures, making it a true "dermoid" cyst. In this case the dermoid cyst was as large as a small orange, but, as it lay wholly within the pelvis between the sacrum and the rectum, alongside of the external coccygeal tumor proper, its existence was not suspected. The small

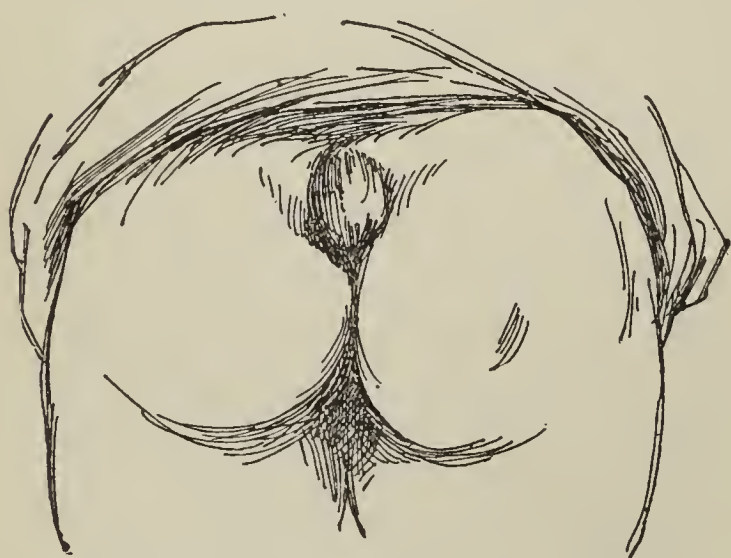
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<sup>1</sup> M. Verneuil (*Rev. de Chir.*, May, 1891, p. 401) relates a case of a fistula in the sacral region, which communicated with the cerebro-spinal canal, which may have had its origin in the neurenteric passage.

fistula that existed, which really opened into it, was thought to be an outlet of the visible tumor. It was filled with sebaceous matter, a considerable number of short, fine hairs, and curious flakes of carbonate of lime, exactly resembling fragments of egg-shell. They were probably an abortive attempt at the formation of teeth.

To proceed, then, with the history of the case: Miss C. F., aged thirty-one, was admitted to St. Agnes's Hospital, May 19, 1891, complaining of a small tumor in the region of the coccyx. She states that she has had this tumor from her birth, that it has grown very little, if any, but that it has gathered and burst several times, the last opening not yet having healed, and that she cannot sit with comfort. As her occupation is that of a carpet-sewer, it is a serious bar to earning her living. On examination I find a tumor, three inches long and two inches wide, situated directly anterior to the coccyx. It forms a pro-

FIG. 5.



CASE IV.—Tumor of post-anal gut with a dermoid cyst.

jection of about an inch and a half, and presses the coccyx so far back as to interfere with sitting. The coccyx is both long and movable. Examination by the rectum shows that the tumor rests on the bowel, but does not communicate with it, so far as can be judged by touch. There is a small sinus on the right buttock an inch away from the tumor, which is discharging a little watery fluid. The edges of it are slightly red

and inflamed. There are three other scars of former discharges, now healed.

*Operation, May 23, 1891.*—An incision was made over the coccyx and the coccyx was excised, together with half an inch of the end of the sacrum, which was also displaced somewhat backward. While removing the coccyx a dermoid cyst anterior to it was opened and explored by the finger. It was found to be in contact inferiorly with the coccygeal tumor proper, which showed externally, the dermoid lying entirely within the pelvis and not being visible from the exterior. By rectal touch it could not be distinguished from the coccygeal tumor, the two tumors seeming to the touch to be one. The dermoid was about two and a half by three inches. Its deeper wall was immediately in contact with the rectum. Its contents consisted of sebaceous matter,



without the ordinary sour odor of such material, quite a number of hairs, one to two inches in length, and on washing out the cavity with a dilute solution of bichloride some twenty or thirty small fragments that resembled bits of egg-shell were washed out. These were distinctly gritty to the touch, but had not been perceived at all in a careful examination of the interior of the tumor. They are probably imperfect dentine.

During the manipulation of the dermoid tolerably free hemorrhage took place from the interior, which was checked by hot water, the application of which shrunk up the sac so that it was not over an inch in diameter. The incision was now prolonged into the coccygeal tumor to determine positively its nature. It was found to consist of a number of small cysts, such as are typical of such tumors, but, as it was so much smaller than had at first been supposed, and as it had not grown since her birth, and was not in itself a serious inconvenience, I decided to let it alone. Its removal could be accomplished at any time if it should grow. The dermoid cyst was now loosely packed with gauze and the wound closed and dressed as usual.

The temperature never rose above  $99^{\circ}$ , but the wound has not healed; a small sinus which runs into the shrunken dermoid still persists and will probably require another operation.

Dr. Coplin reports on the contents of the dermoid as follows: "It contained fat, cholesterin, hair, and lime salts. The small egg-shell-like fragments were closely examined by Drs. Thornton and myself, and were found to consist of the carbonates of sodium, potassium, and calcium, and some organic matter. One surface of these fragments was covered or lined by a thin membrane, microscopically identical with the membrane lining an egg-shell. No histological difference was found, but when both were washed in a salt solution, then in water, and then calcined, the egg-shell calcined white, while the fragments turned black and were slow to crumble."

## POTT'S DISEASE OF THE SPINE.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

BY V. P. GIBNEY, M.D.,

Professor of Orthopedic Surgery, New York Polyclinic; Surgeon-in-Chief to the Hospital for the Ruptured and Crippled; First President of the American Orthopedic Association; Fellow of the Academy of Medicine, etc.

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GENTLEMEN,—During the past week I have intended to give you a lecture on Pott's disease of the spine, and this morning I have a number of cases that will illustrate certain phases of the subject. I do not know of any deformity more interesting or important to the general practitioner than the one now considered. We have coming into the large cities cases that have been overlooked in diagnosis. These cases of Pott's disease of the spine are a source of great anxiety to the family, who soon summon the family physician. It is he who has the first opportunity of making a diagnosis. Signs come on so insidiously that I think that no one can tell you too much about the early stages of the disease.

One of the most important essentials in the early diagnosis is a routine habit of examining thoroughly. Every child who is sick or who has not merely an ordinary ailment should be stripped naked and examined in a warm room at the time that you make your first visit. This may seem unnecessary to many who pride themselves on their diagnostic skill, keen perceptions, and knowledge of the tongue, liver, and various organs; but it is in just this way that the disease is overlooked. Spinal disease is sometimes called "growing pains," because the pains are confined to the limbs; often it is called gastric catarrh, because of the pains about the stomach. If you consider for a moment you can explain the symptoms; for in the dorsal or upper lumbar region an exit is given to nerves that supply the lower extremities and the lower part of the abdomen. Now, if there be irritation at the origin of these nerves, the pain will be referred to the region supplied by them, be the irritation mechanical or vaso-motor.



Such pains ought invariably to lead you to suspect some trouble with the spinal column, but the habit of making a careful routine examination will enable you always to at least do your duty. In that way you will be on your guard, and you will not let the child go on suffering from vague pains, nor will you experience the disappointment of having the mother or some female friend point out a knuckle on the back that could be seen across the street. This has often occurred.

By early and thorough examination you will be able to recognize disease before the deformity arises, and you will have gained a good deal of information. In order to get at this subject you must first know something about the pathology and clinical history. With this fresh in your mind, you can make a diagnosis by stripping the child and looking over the whole body. It will take only a few minutes, and you will gain more knowledge of the case in that time than by a whole hour's talk.

In considering the etiology of Pott's disease of the spine, you must remember that it is the same as that of hip-disease (tubercular osteitis of the hip), of white swelling of the knee, or of tubercular disease of the ends of any of the long bones so common to children. Its diathesis is either hereditary or acquired. By diathesis you understand that inherited peculiar make-up or disposition of the body which renders the patient vulnerable. It is unnecessary to assume that consumptive fathers and mothers will have consumptive children, but what does happen is that their children are liable to become consumptive. The disease is not hereditary in the sense that rheumatism or insanity is hereditary. A rheumatic or insane mother may have a tubercular child, and tubercular parents need not necessarily have tubercular children. The feeble condition of the parents may make the child vulnerable, so that any little exposure or trauma may induce the disease in that particular child. It is difficult to give you any very definite views on the subject,—to tell you how heredity acts. At all events, something is present that goes through generation after generation; and we know that when tubercular parents have a child, it is our duty to put that child under such surroundings that it shall not develop disease of this kind. We have sent the children of parents subject to tuberculosis out into the country, and they have grown up healthy. Often fathers have made this statement: "Twenty years ago my children were all puny and delicate and my wife was not very strong; so we came out to this country place and let the children play out of doors, and they all have grown up healthy."

The diathesis may be acquired. A child may have whooping-cough or any of the exanthemata; he may have cholera infantum at the time when he makes tissue most rapidly,—“the developmental period of life,”—and he may have this disease followed by a long tardy convalescence; that convalescence may be followed by a diathesis, just as if it were inherited, rendering the child strumous or scrofulous; then the little fellow may stumble or strain himself while skating or running, or may be exposed to cold, and will develop in his back a little focus of inflammation in a centre of development, a small reddish spot which spreads rapidly during the exacerbations of the disease and then spreads gradually, so that eventually the whole bone is involved. Reflex spasm will be caused by this local irritation. Deformity will be produced by the pressing of the bodies of the vertebræ down, making an angle where contiguous vertebræ touch. So, etiologicaly, predisposing and exciting causes are found; the former the diathetic condition, and the latter injuries and exposure.

Pathologically, then, we may recognize the disease as a local inflammation in the bodies of the vertebræ. First there is a small centre of development that extends to contiguous parts of the bone; the bone breaks down about the diseased centre and the disease spreads by continuity, involving the articular surfaces. When the anterior portions of the bodies of the vertebræ are affected, we get reflex spasm. Eventually the bodies, cartilages, and ligaments are involved, and often, too, the transverse processes. The periosteum participates, and, still further, you have the tissues within the thoracic and abdominal cavities involved; the ribs may be included in the process; the whole may form a conglomeration of tissues that serve in their cicatrization to render the child deformed and unhealthy for the remainder of its days. There are, fortunately, not many of these that you see in civil practice; but the other evening I saw a little golden-haired girl with shoulders approximating her ears dressed in gorgeous apparel at a ball. She was on the floor, with a tall gentleman escorting her, and I heard some one shudder as she passed. A lady with me said, “I have a great admiration for the man who takes her about the floor in that way.” I have seen these cases in the early stage where there was just a spinous process projecting. I have seen and recognized them before the spinous process projected, and I have tried to bring them under treatment; but for some reason they failed to appreciate the long care required, came out with immense deformity, the ribs going down to the pelvis, and abscesses forming. You have to tell the parents that the children will not be much shortened in stature, and yet all the time



you feel that they are being stunted in growth. Some practitioners would say that they were wearing the braces too long and that it was "just like a specialist" to keep the brace on year in and year out.

CASE I.—This little child is two years and five months of age. You see his attitude. The head is thrown back ; both shoulders are bent forward ; you notice the depression of the chest ; observe the way he stoops. The lesion would seem to be in the upper cervical region. He walks cautiously, and has a careful stoop as he bends his spinal column forward. Now, if you put the child across the mother's lap and make traction on the spinal column, it comes quite straight, so that the deformity disappears ; there is no deformity in the cervical, dorsal, or lumbar region that we can make out. There is a certain amount of spasm of the post-cervical muscles. You will learn something about the way he "handles himself" at home. The mother gives this history : He was well all last summer ; and a month ago he was quite well, but a week ago he began to hold his head back. He had not had measles or scarlet fever. *Four months* ago he had a fall ; his sister was carrying him and they both fell down stairs ; she says he fell upon his back. He has not been restless in sleep or groaned. The first sign of ailment occurred last Tuesday morning, when he came in with his head drawn back, and on Wednesday he was worse. In the morning when he gets up he is apparently well ; when he has been around about an hour he gets headache, and his head is thrown back. The woman says that she lives in Harlem and that they have had malaria. I find no enlargement of the spleen ; the temperature is normal. Referring to the fall, there have been some symptoms between this and then ; it is possible for the child to have developed the disease before the time at which it was noticed, the deformity being so slight that it could have been overlooked.

CASE II.—Here is a child, three and a half years old, who is in a crouching position, supporting himself by placing his hands on his knees, and who, in endeavoring to stand, climbs up with his hands on his thighs. In endeavoring to walk he takes a short, measured step. Even money won't induce him to stoop. This child is further advanced than the other : he has been suffering for more than two months. He was perfectly well last summer. Two months ago he got sick and was in bed for a week and then got up unable to use his foot. The mother then consulted a doctor and got a prescription. Two or three weeks after that he began to walk in a peculiar way and would scream if his back were touched ; in lifting the child they had to be very careful. The little patient would cry during the day, and at night he

lay on his face twisting about and never sleeping well. The projection of the back was first noticed two months ago. The doctor told her it would probably go away, and directed her to bathe it with a little hot water and rub with a little iodine. The mother thinks that during the last two weeks the projection has increased.

We will assume for the sake of argument that Case I. had Pott's disease, though his temperature is  $99.4^{\circ}$  F. If the mother's statement be true, the child might have the quotidian type of malaria. Children often have spasm of the post-cervical muscles in malarial troubles, bringing about malarial torticollis. What I propose is to have Dr. Holt go over the spleen, and, if necessary, examine the blood for evidence of malaria. I think we have reached that degree of proficiency where we can positively diagnosticate the existence of malaria. I don't know what else this could be except malaria or Pott's disease. It might be rheumatism, but that is very improbable; rheumatism so rarely affects the muscles at the back of the neck that this may be excluded. We have for differentiation malaria, neurosis, and Pott's disease of the spine. At all events we shall keep the case under close observation and have her report here again one week hence. We shall call it, however, a type of Pott's disease of the upper dorsal or cervical region, of which the symptoms are chronic spasm of the post-cervical muscles and bending backward of the spinal column, producing this peculiar gait; pains in the back of the head, sometimes extending down the arms along the brachial plexus; pains in the chest and that distress of breathing which occurs with affections of the respiratory nerves; faulty position of the head and neck, interfering with the transmission of air into the lungs. These are the signs, although there is no deformity. The presence of these signs, together with the history, extending over two or three months, would be significant.

This may be the first exacerbation in this particular case. With these symptoms you should watch the child carefully, and, the moment you get a confirmation of your view that it is Pott's disease, put on a plaster-of-Paris jacket to keep the spine in good position; you should also have a head-rest or jury-mast. Keep the child in bed for a week or two, until he is able to go about. So much for the mechanical part of the treatment. The constitutional part consists in giving cod-liver oil, iron, stimulants when necessary, and as much out-of-door life as possible. Give the child plenty of milk and bread. It is as important to attend to all these details, if you mean to get the child well, as it is to secure good mechanical treatment.



Case II. represents the disease in the dorsal or dorso-lumbar region. There are here what we very seldom see,—two foci of disease; there is a focus about the last dorsal and first lumbar region and one at the mid-dorsal. The normal mobility cannot be made out. There is great tenderness here; and you get tenderness on pressure over the chest-wall, and along the course of the nerves that start from this part of the spine. If you suspend the child by the head in this way, you can overcome a good deal of the deformity. As I press on the abdomen I find a tumor in the right iliac fossa; you see it bulging a little just above Poupart's ligament. When I press upon the tumor the child screams, and every scream makes the tumor more prominent; and fluctuation is present. On the left side I can get my finger down into the iliac fossa. I can't extend the right thigh as fully as the left, while flexion on each side is normal. The child has, then, two foci of disease. There is one in the dorso-lumbar region where the psoas takes its origin, and in the sheath of this muscle an abscess has formed; the vertebræ have become disintegrated and the débris seeks the surface. The upper part of this abscess-sac may be close to the pleura; there may be a thickened pleura produced by the abscess lying in front of the bodies of the vertebræ, thus forming a protection against the opening of the abscess into the thoracic cavity. Sometimes these abscesses press so closely against the pleura that it is destroyed; then the abscess comes in contact with the lung and adhesions take place; later still pus breaks through into the lung and is expectorated through the bronchi.

CASE III.—We have here this history: Three years ago the left half of the neck began to swell; later there was suppuration, and the swelling began to disappear two months ago. A swelling about this time appeared on the spine, and then the child went to Forty-Second Street Hospital and had a jacket put on. You can see where the abscess was situated, here on the right side of the neck. Now this child presents disease in the dorso-lumbar region. There is an abscess which comes from diseased bone, pursuing the same course as in the other case, with this exception: it has not entered the sheath of the psoas, but the perinephritic tissue, and is seen in the ilio-costal space. There is fluctuation without any doubt; you get it distinctly at the posterior part of the ilio-costal space. We sometimes have these abscesses on the chest-wall. Sometimes they get between layers of fascia and pass down over the gluteal region; sometimes open into the rectum; in fact, no part of the body is free from the invasion of these abscesses in Pott's disease.

In making your examination it does not matter how much the child screams or cries; these difficulties ought to make you all the more anxious to get at the bottom of the trouble. In examining the ilio-costal space for an abscess, the child's crying is an aid to you. My finger in the right iliac fossa here feels the bone, and on the left side I feel an abscess in the ilio-costal space.

CASE IV.—This girl is twelve years of age. She was brought here two and a half years ago with a disease extending over a period of six months. A plaster jacket was applied. As I press upon the abdominal walls with my hand, you can see the psoas abscess. I show the case to make you familiar with the manner of detecting abscesses.

CASE V.—This young man came to me two or three months ago with early Pott's disease. I put him up in a very comfortable plaster-of-Paris jacket, but it was thin, and after a while began to give way. He then commenced to have pain, so he came back for a heavier one. It was at a time (this second visit) when I was crowded with work, but I did my best to get it on well. After he returned home, I learned that the jacket did not fit well; it was tight and uncomfortable; they began to cut it from below up, but the abdominal walls projected beyond the lower border, and eventually they cut the whole thing away. The boy came back again, having lost about ten pounds and looking as though he had "gone through an auger-hole." Last Wednesday I applied this jacket under almost all the same conditions, and he has been reasonably comfortable. He sleeps well at night, and I expect the jacket to last some months.



# REMARKS ON CHRONIC GLANDULAR ENLARGEMENT IN CHILDREN, AND ITS TREATMENT.

WRITTEN EXPRESSLY FOR "INTERNATIONAL CLINICS."

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THE period of childhood is particularly prone to affections of the lymphatic glands, yet it is remarkable how seldom the disease is primary. Thus, sarcoma and lymphadenoma, though they occur with regrettable frequency, must be regarded as uncommon diseases. Secondary disease of the lymphatic glands, however, is an exceedingly common, not to say the commonest, disease of childhood. Of all the systems, the lymphatic seems to be the most vulnerable during this period of life. Perhaps this is only the natural result of the extent and functions of this system, and of the great developmental activity which is going on in the young growing subject.

It is quite impossible in the large majority of cases to define what is, and what is something more than, simple inflammation of a gland; for the diathesis and constitutional tendencies of a child will necessarily influence not only the onset, but the course of a glandular affection. Both the chronic and the suppurative forms of adenitis are usually associated with some exciting cause, acting over the area through which the lymphatic radicles pass on their way to join the glands. These areas are frequently placed at some distance from the affected glands. Thus, injuries and abrasions about the feet and legs lead to glandular disease in the femoral region; irritation about the genital organs leads to irritation of the inguinal glands. As too many members of our own profession well know, injuries to the fingers—post-mortem or dissection-wounds—lead to glandular troubles in the axilla.

In a certain proportion of cases, however, enlargement of the glands in different regions will become manifest after an illness, without the obvious intervention of any appreciable local conditions such as are

generally existent: in such cases it would seem as if some *materies morbi* had been circulating through the system at large, which, as it filtered through the lymphatic glands, gave rise to their enlargement, and was in this manner eliminated. In childhood malignant disease occurs so seldom that it may practically be ignored as a starting-point for chronic glandular trouble such as will be chiefly discussed in this paper.

Unfortunately, one of the commonest positions both for chronic and acute inflammation of glands during childhood is in the neck. I say unfortunately, because considerable disfigurement, not to say deformity, from scarring but too often follows glandular trouble in this region. The frequency of adenitis is due partly to the rich supply of glands and partly to the very manifold sources of irritation to which the glands are exposed in this region.

Unquestionably constitutional peculiarity plays a very important part in determining glandular disease. There are children whose lymphatic systems are exceedingly vulnerable, and react to the smallest stimuli; in such the acute form of adenitis is the one in which the disease commonly manifests itself; the glands inflame rapidly and evacuate themselves by suppuration. Herein lies safety. Some forms of irritation are so septic that acute glandular abscess will supervene, both in those whose glands are not usually susceptible, and in those of a lymphatic temperament, whose glands usually take on chronic changes. Thus both the constitutional idiosyncrasy and the nature of the irritant exercise a determining influence on the resultant disease.

Children with a tendency to glandular enlargement are generally spoken of as "scrofulous" or "strumous." Although somewhat unscientific, the term nevertheless conveys both to the public and the profession a fairly definite clinical idea. The following, more or less, expresses this idea: scrofula is a constitutional condition, manifesting itself in a special tendency to chronic inflammatory affections, especially of the lymphatic system and glands, which are very easily set up, difficult to arrest, and frequently terminate in tuberculosis.

On what does this scrofulous habit depend? Is it specific in its nature,—that is to say, is it dependent on some special cause? Or is it rather the expression of a general debility? The conditions under which scrofula is most usually and most abundantly developed are apparently somewhat contradictory. Formerly called "king's evil," on account of its frequent appearance in the children of reigning families, it is likewise found among the poor of every large city in the world. In both rich and poor alike, scrofula is largely an inherited debility of tissues. Among the rich, a delicate child receives every



care and attention which medical advice and ample means can secure for it, and thus the inherited evil is minimized. Among the poor, the same unfortunate circumstances, which have pressed so hardly upon the pregnant mother, continue to press upon the child in its independent existence. Hence it is that scrofula seems to be so much more common among the poor than among the rich. But the tendency, once inherited, can never be quite got rid of, and those who see much of children's diseases know full well that this factor has to be reckoned with in all stations and among all classes of society.

As a rule, when the irritation is very acute, the glands rapidly suppurate and discharge themselves, thereby effecting a cure. In a certain number of cases, however, sometimes for the want of due care, sometimes notwithstanding all care, this acute inflammation gradually subsides into a chronic inflammation; neighboring glands become affected; they enlarge and indurate, and resist treatment. The question then arises as to what is the exact nature of this condition, and what its relation (if any) to tubercle.

I have many a time removed enlarged glands and failed to find any satisfactory criteria of tubercle, but simply hypertrophy, with no signs of caseation, and no difference in the glands of different ages,—that is to say, in glands removed after six months' duration, and in glands removed after twelve or eighteen months', and even longer, duration. In other cases, perhaps in the majority, the glands within a few weeks or months caseate; they may or may not suppurate, and on microscopic examination tubercle-bacilli may or may not be found. Are all caseous glands tubercular? If so, are there any signs by means of which we may early recognize and differentiate the glands with tubercular tendencies from those which appear to have no such tendencies. I confess I know of none. In a few cases such a change can be suspected; but in many more the transformation takes place very slowly, very insidiously, and without causing any constitutional symptoms whatever. Some enlarged glands will remain unchanged for months or years, not altering in size or appearance. Then a change sets in; the glands increase in size; become somewhat painful and tender on pressure; little by little the superjacent skin becomes adherent, then red, and finally breaks down. On examination a typical tubercular focus is found. In such cases there may or may not be a tubercular family history. On the other hand, we see cases of two or three years' duration clear up without our being able to assign sufficient reason. The patients do not show any very obvious improvement in their general appearance,—they get no special treatment, and

make no change in their mode of life. That some change does take place I can hardly doubt,—most probably an unsuspected source of irritation has spontaneously cleared away, and the glands quietly undergo retrogressive changes. Many children whose glands are permanently enlarged seem quite strong and healthy; they grow up, and as adult life comes on lose this enlargement and appear to quite outgrow the weakness.

Among the most fruitful sources of glandular trouble must be reckoned the exanthemata. Apart from nasal and pharyngeal catarrh in measles, and “sore-throat” in scarlet fever, there seems a strong predisposing influence in the *materies morbi* of both these diseases to affect the lymph-glands,—not only those that are visible, but internal glands also. In looking over my note-books I am much struck by the frequency with which these diseases are credited for the glandular disease. As a rule, there has been considerable enlargement at the time of the exanthem; then the enlargement has gradually subsided, or nearly so; after an interval a further enlargement has commenced and steadily persisted,—a slow, chronic, painless enlargement, with curious intermissions; the glands, however, never quite disappearing.

Some time ago I was consulted by a nursing Sister for chronic enlargement of the glands in the neck. She had tried all kinds of treatment: rest, change of air, local applications, general tonics, all in vain. She was very pallid, latterly easily fatigued and obliged to desist from her duties—symptoms which were attributed to her glandular disease. On inquiry, I found that some two or three years previously she had been sent into a provincial town by the Sisterhood to which she belonged to nurse the poor in a district where scarlet fever was epidemic. She entered on her duties with great spirit and continued them for some weeks; then, feeling ill and worn out, she was obliged to give up. It was thought that she had overtaxed her strength. She was not aware of having taken the fever,—that is to say, she never had any rash,—but confessed that she had a slight feverish attack shortly after commencing work, which was attributed to catching cold and sitting up at night, and that she had never been the same woman since. On examining the urine, I found that it became solid on boiling.

This Sister presented no local conditions in the pharynx or nasopharynx, or on the skin, or anywhere else, which could be invoked as a cause of her glandular enlargement. I need hardly say that I discountenanced any surgical interference with these glands; they were quite quiescent; the skin was not adherent, and they moved freely among themselves. Under suitable treatment and diet the albumin in









Chronic glandular enlargement in a child.



the urine rapidly decreased, and *pari passu* with the general improvement her glands began to subside. I have no kind of doubt that, in this case, the Sister had a mild attack of the fever, and that her nephritis was the result (as it so frequently is) of want of due care during the febrile stage, and that her glandular trouble was one expression of the debilitating influence of the kidney-trouble. As the one cleared up so did the other, under general remedies.

I had under my care some little time ago a girl aged six and a half years. Her condition when I first saw her is given in the annexed plate. (See figure.) It appeared that she had measles when three and a half years old, and six months later the glands on the left side of her neck began to enlarge. When four and a half years old she had scarlet fever; her throat was not much affected at the time; but very shortly after the fever the glands in the right neck began to swell, and rapidly caught up in size to those on the left side; the glands on both sides continued to grow steadily, notwithstanding all kinds of treatment, during the next two years. It was at this stage that I first saw her. A careful examination of the naso-pharynx failed to detect any condition which explained the adenitis. She had no other enlarged glands in either the axilla or groins; the glands were quite painless, movable among themselves, and appeared free from any suppurative tendencies. On the other hand, though well cared for, the child seemed remarkably prone to *pediculi capitis*, and it was with the greatest difficulty that they could be exterminated. I removed these glands at two operations within an interval of two months; they extended deeply, and were intimately adherent to the sheath of the great vessels. The child made an excellent recovery, and there was no recurrence.

Some five or six years ago, a little girl, about four years old, was brought to me on account of enlarged lymphatic glands in her right neck, and some of these were very large; but there was quite a number of smaller ones extending back into the occipital region, and others coming downward towards the clavicle; some others could be felt below the clavicle. On stripping the child a considerable number of smaller glands were found in the axilla, also, of the same side. No other glands were appreciable in any of the other usual situations. For a long time I sought in vain for an adequate source of irritation. Then I learned that the child was very subject to cold in the head, and that she was feverish and restless at night during these "colds." Her pharynx presented nothing peculiar, her tonsils were not larger than normal. Attention at this time was being given to the post-nasal adenoid growths, first described by Meyer, of Copenhagen. I deter-

mined, before proceeding to extirpate these glands, to examine the posterior nasal region, and, as the child was young and resisted, chloroform was administered. I now found a considerable growth of this adenoid tissue, not sufficient permanently to occlude the posterior nares, but enough to do so when this new growth became congested. I thoroughly scraped it away, and cleared out this region. Within a very short time the glands in the neck began to diminish in size; the child slept better and lost all tendency to "colds in the head." I prescribed liquor arsenicalis and a stay at the sea-side. Within three months the child had completely recovered.

I have no doubt that chronic enlargement of the glands represents a chronic source of irritation somewhere; this source may or may not be within our reach, but for successful treatment it is very essential to know where the source of irritation probably lies. I now have in my mind cases of cervical lymphadenitis, not only, as before said, on account of the frequency with which we meet with these cases, but also on account of the disfigurement which often follows.

Before speaking of treatment I shall briefly mention some of the conditions which I have found associated with glandular enlargement in the neck in young subjects. Besides the action of the exanthematic fever-poisons, to which I have already briefly alluded, skin irritation of every kind about the scalp, face, and neck is the most frequent as well as the most obvious source of irritation. *Pediculi capitis*, by giving rise to *impetigo*, sometimes even without doing so, are another very frequent source of trouble. Unhealthy conditions of the mouth and gums, as decayed teeth, play an important part. Chronic inflammation in the naso-pharynx is another common and often unsuspected cause. Granular eyelids, conjunctivitis, and other forms of chronic inflammation account for a due proportion of cases. Chronic pharyngitis and large tonsils are also well-recognized sources of irritation. Less common sources are the irritation conveyed from distant glands. Thus, in a few cases of enlargement of the deeper set of cervical glands the irritation has evidently come from the chest. This I have verified by post-mortem examinations. Chronic enlargement of the bronchial glands, so common after bronchial catarrh, should never be lost sight of when searching for some cause, or when, after searching, a sufficient cause is not very apparent.

I have ventured to specify these various possible sources of irritation in cases of chronic glandular enlargement, for the first step in the rational treatment of such a condition is obviously to try to remove the cause. I have constantly seen cases, which were stated to have



resisted all kinds of treatment, in which I have found, on examination, unhealthy local conditions of neighboring parts, for which little or no treatment was being carried out. It is hardly necessary to say that a cure cannot possibly be expected under such circumstances. The glands certainly could be extirpated, but in all probability other glands would quickly make their appearance, unless the original source of irritation were also got rid of.

Treatment must be general as well as local. Seeing what an important part is played by personal proclivity to glandular disease, general treatment becomes of the first importance. When it is possible, change of air, of scene, and mode of living should at once be suggested. Sea-air in a bracing district is by common consent one of the most potent aids to recovery that we have at our disposal. We must not expect—as is sometimes done—to get improvement straightway. The longer the condition has lasted at the time treatment is commenced, the longer the time necessary to effect a cure. When asked, I generally say that treatment should be continued for about the same length of time as the disease has continued, it may be with intermissions or not, according to circumstances. Firmly believing that constitutional peculiarity is largely responsible, I am not content to order a few bottles of cod-liver oil and a week or two at the sea-side. No reasonable person can expect to make much or any impression on a constitution in this manner. In the case of boys and girls at the school-age with marked glandular proclivities, I should advise that they be sent to a school in some sea-side town. When the weather is warm, sea-bathing; when cold, bathing in a tepid sea-water swimming-bath will be highly beneficial. When these cannot be had, sea-water baths may be substituted. Friction and massage, exercises, drilling are all good as promoting circulation and metabolism.

Good food in sufficient amount is of great importance in such cases. Especially in school-children, this question of food must be satisfactorily solved if treatment is to be successful. My own experience leads me to think that too little attention is given to food in schools, and that there is ample room for improvement both in its quantity and quality. Plenty of milk (which should be good), eggs, bread, butter, oatmeal porridge, and fruit are not only most wholesome, but essential to health. Attention is required to secure well-ventilated sleeping-rooms; overcrowding is a serious factor in the production of bad health and in lowering the constitutional vigor of young subjects. Until all such general debilitating influences have been removed, neither medicinal nor surgical measures are likely to prove of much avail.

Among drugs for internal use cod-liver oil stands pre-eminent. It should be given very shortly after food, in small doses. Large doses nauseate, and a considerable portion of the dose passes away undigested. A teaspoonful of the oil in some suitable medium—wine, black coffee, peppermint-water, or milk—may be prescribed twice a day, after breakfast and after tea. Even for adults, when there is any intolerance, this small dose will be found most useful and efficacious. I do not, as a rule, believe much in the so-called purified or tasteless oils, for, if much purified, the oil loses its specific quality. A few grains of salt added to cod-liver oil render it more palatable and more easily borne. Small doses of mercury—half a grain of the gray powder—twice a day, continued for some time, are often useful. Arsenic in the form of Fowler's solution is a most valuable remedy. Given in small but increasing doses three or four times a day, at meal-times, it is usually very well borne, even by irritable stomachs. Being tasteless, it can be dropped into the water, or milk, or other fluid which is being served at the meal. Nor must iron, in some of its many forms, be omitted, especially when the adenitis is associated with anæmia.

Iodine inhalations are often very useful. I order a little iodine to be placed in a wide-mouthed bottle, which is to be left in the bedroom uncovered, or simply covered with fine gauze, and allowed to slowly sublime. Or from sixty to one hundred minims of the tincture may be dropped onto a saucer and allowed slowly to vaporize in the bedroom during the night. Besides securing a small and almost imperceptible dosage of iodine over a long period, this is a simple and efficacious means of purifying the air of the sleeping-room.

External remedies are very useful when properly applied. As has already been said, though local, glandular disease is usually secondary; the source of irritation or primary disease being in distant parts. Hence, it follows that remedies intended to act on any given set of diseased glands should be applied to the parts originally affected, in order that they (the remedies) may be carried into the glands by the same channels as have conveyed the *materies morbi*. Only such remedies should be applied as can be absorbed; so soon as the external skin shows any signs of irritation, the application should be suspended for awhile. The most efficacious method of applying such remedies is by inunction; mercury, iodine, arsenic, or lead, according to the nature of the patient and of the primary disease, can be used. One or other of these substances should be mixed with oleic acid in varying proportions, and a little of the ointment should be well rubbed into the skin over and for some distance around the affected glands. It does not



suffice to smear it on, it must be gently but thoroughly rubbed in, for ten to twenty minutes at a time, two or three times a day. If the affected glands are in the neck, for instance, the ointment should be applied up into the scalp and over the upper portion of the chest-wall, back and front; if the armpit be the seat of trouble, the ointment should be applied to the whole of the upper limb and about the shoulder. The larger the area of skin acted upon, the larger the number of lymphatic stomata to absorb it.

Painting with tincture of iodine is the routine treatment usually adopted, and this is often applied until the skin is quite sore. I can hardly doubt that such treatment will increase rather than soothe the irritation. Iodine can have no specific effect unless it be absorbed, and only healthy skin can absorb drugs that may be applied to it.

In addition to general and local treatment, attention must also be directed to the original source of the irritation. It is not very probable that such obvious sources of irritation as eczema, impetigo, otorrhœa, or conjunctivitis will be overlooked. But they must be remedied before we can expect any permanent improvement in the glands. Decayed teeth, unhealthy conditions of the mucous membrane of the mouth, large tonsils, and especially adenoid growths in the nasopharynx often exist without attracting much attention. It is in the highest degree important that these conditions should be taken in hand. For the mouth and pharynx, the application of glycerin of alum or glycerin of boric acid is recommended; or thin solutions of alum or borax or resorcin may be sprayed into the pharynx. If the posterior nares are affected a few drops of a tepid solution of one or other of these drugs may be snuffed up out of the palm of the hand or be injected by means of a nasal douche or syringe.

Other measures having failed, extirpation of the glands may be undertaken. Having decided on the radical measure, a time should be selected when the general health is fairly good, and the local surface-conditions are as free as possible from inflammation. Especial care should be taken to shell out the glands without bursting them; for this lessens the danger of any infection of the wound, and helps to secure rapid and primary healing. Free irrigation with hot water and the arrest of all hemorrhage help on primary union and lessen the need for any drainage-tube. If thoroughly extirpated, if there be no local infection of the tissues with tubercular matter, and if the original cause of the irritation be removed, recurrence will not take place.

# Genito-Urinary and Venereal Diseases.

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## TUBERCULOSIS OF THE BLADDER.

CLINICAL LECTURE DELIVERED AT ST. LOUIS MEDICAL COLLEGE.

BY JOHN P. BRYSON, M.D.,

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THE group of cases to which I shall call your attention this evening is supposed to be among the rare affections of the genito-urinary organs, but a glance over my own case-books, and a look at the mass of material appearing in this clinic, hardly justifies me in believing otherwise than that the cases are far more common than is generally supposed. We study this evening some of the manifestations of tubercular affections of the genito-urinary organs.

The time has passed when we can content ourselves with a mere anatomical diagnosis,—when we can be satisfied to say, “This patient has cystitis, this one a prostatitis, this one a urethritis, this one an epididymitis.” We must go a step further when it is possible, and say what kind of a cystitis, what kind of a prostatitis; for, as between a tubercular and a gonorrhœal prostatitis or cystitis, the prognosis will vary widely, so that in the end we must make, wherever it is possible, not only an anatomical but a pathological diagnosis. We must be able not only to say that certain anatomical structures are affected, but also name the etiological factor.

Tuberculosis uro-genitalis belongs to so-called “surgical tuberculosis.” Koch has taught us that the etiological factor is a bacillus which can be identified microscopically, and this item of knowledge has advanced, to a marked degree, not only our powers of diagnosis but also our conception of the disease. All those diseases are called tubercular which have for their etiological factor the bacillus of Koch. Moreover, we no longer believe in an idiopathic inflammation, so that



we must permit the terms idiopathic cystitis, idiopathic prostatitis, etc., to fall out of our vocabulary. We must, at whatever pains, attempt to get at, in each case, the etiological factor. It is with the intention of explaining to you the methods employed in making not only the anatomical but the pathological diagnosis that I exhibit to you this group of cases to-night. In some the diagnosis is positive and definite. In others there were originally doubts, which have been cleared up by continuous study. A third class remains still doubtful, but we have hopes of arriving at an accurate diagnosis by more study and observation. The question of the differential diagnosis is an etiological and not an anatomical one.

CASE I.—E. L. I., aged thirty-two, single, a resident of St. Louis, a clerk living a sedentary life, is a stout, robust young man, whose family history is excellent. He was a delicate boy until nineteen, when he grew strong. Since then he has had no serious illness. He comes complaining of inability to retain his urine longer than one and one-half hours during the day. When taking active exercise he is not able to retain it longer than half an hour. During the night, when at his best, he rises to void his urine four times; when at his worst, he rises nine times; but he can find no reason for this variation in frequency. Pain, when he has any, is of a throbbing, dull kind, and is felt at the end of miction. When asked to locate it, he tells us that it runs from the bladder along the urethra. Lately he has had some aching sensation in the loins, chiefly on the right side. This condition has existed for the past eight years. Blood first appeared in the urine eight years ago. These symptoms, of course, as regards frequency, pain, and hæmaturia, vary considerably and irregularly. Seven months ago he had severe dysuria after holding his water for five hours. He then voided with great pain a considerable quantity of bloody urine, in which were some clots. During the last few years the urine has always appeared to him pinkish and somewhat cloudy; he feels best when the urine is clearest. He dates all his urinary symptoms from a gonorrhœa, which he had eight years ago and which lasted for three months. At the age of fifteen he fell astride a pole, injuring the left testicle, which swelled up; and he passed blood about one week later.

*Physical Examination.*—Four ounces of urine, passed in separate vessels, is pinkish with blood. In the first glass we find one blood-clot of about the size of a small pea. That passed in the second glass is more cloudy, redder, but contains no clot. Examining the penis, we observe that the veins on the dorsum are enlarged and distended. Both testes are small, soft, and devoid of nodules or hard lumps. The epididymes

are normal. A finger in the rectum discovers a prostate a little larger than normal, irregular in outline, nodulous, the projections being woody to the touch. A hard mass occupies the middle and posterior part of the left lobe, and two smaller hardened masses are to be felt in the right lobe,—one in the centre towards the apex, the other towards the posterior and outer border. Both of the seminal vesicles, as far as they can be felt, are knobby, hard, and irregular. A bulbous sound, No. 22 French, discovers a sensitive urethra without stricture, but some bleeding in the deeper parts. He was sounded for stone by a surgeon six years ago. This also set up bleeding and much vesical irritation, laying him up for six weeks. About three weeks ago he had his bladder washed out, first with boric acid, and afterwards with a bichloride-of-mercury solution, the latter causing great pain and confining him to his bed for eight days. The urine shows an acid reaction, a specific gravity of 1022, and a sediment made up chiefly of blood-cells, white and red, a few necrotic epithelial cells, rarely a pus-corpuscle, an absence of tube-casts and other renal elements, and an amount of albumin corresponding to the amount of blood.

Here we have a clinical picture pointing directly to a diagnosis of tubercular prostatico-cystitis. The gonorrhœa which immediately preceded the development of more serious symptoms could hardly bring about such changes as are perceptible to the touch in the prostatico-vesical region. Moreover, hemorrhage is not a symptom of gonorrhœal prostatico-cystitis. In the case of a gonorrhœal prostatitis we should expect to find the organ evenly and smoothly enlarged, even in the chronic form. In the acute form there are, besides, great pain and throbbing. This prostate is comparatively painless on pressure, is only slightly enlarged, but it has an irregularity of outline. Note, further, the difference in consistency of different parts,—here a hard mass apparently embedded in the substance of the softer, normal tissues. Not only is the prostate irregular in outline, but the hard masses are irregular in size.

I would call your attention also to the fact that suppuration exists here, as evidenced by the urinary examination, only to a slight degree. The bleeding is a distinct feature, and is due, undoubtedly, to the erosions of the mucous membrane about the vesical neck. The bleeding occurs chiefly at the end of urination, and pain is often due to the extrusion of clots of blood. It is worth while observing, too, that all instrumentation is followed by hemorrhage and irritation out of all proportion to the force used. Furthermore, washing the bladder with boric acid increases rather than diminishes the distress. Even more



so does irrigation with bichloride-of-mercury solution, one to five thousand, increase the pain, the frequency of urination, and the bleeding. If you wish confirmatory evidence of the pathological diagnosis,—and this you should seek assiduously in all cases,—let me read from the urine-record, that the bacillus of tubercle has been found in the urinary sediments repeatedly. You must remember that, if you are to base your diagnosis on the bacteriology, one bacillus does not make tuberculosis any more than one swallow makes a summer. It is necessary that they should be found repeatedly and in considerable numbers, so that this as a diagnostic element, like all others, is to be taken in conjunction with the other clinical signs in arriving at a definite conclusion. You will not be able to find them in many cases where the other clinical signs all converge towards a diagnosis of tubercular inflammation. It has been my observation that they are more frequently found in a urine which is not decomposed and in one in which the sediment is made up only to a very small extent of pus-corpuscles.

Observe how at once this pathological diagnosis influences both our prognosis and our treatment. Non-tubercular prostatitis not only bears well but demands local treatment,—vesical irrigation, applications to the prostatic region, the use of instruments. If this were a gonorrhœal prostatitis, we could expect beneficial results from the instillation into the deeper urethra, behind the compressor, of a one- or two-per-cent. solution of nitrate of silver. You have repeatedly seen such cases at this clinic rapidly getting well under such treatment. Here we can resort only to general constitutional measures. We give internally those remedies which, acting as tissue-foods, assist the normal elements in resisting the encroachment of the pathogenic micro-organism. This patient has been taking the hypophosphites, the malt preparations, and cod-liver oil. No instrument has passed his urethra since the diagnosis of tuberculosis was made.

As for the prognosis, it is unfavorable in regard to ultimate cure. The best we can hope to do is to stay the progress of the disease, rendering its course more chronic, and by the class of tonics just mentioned increase the powers of resistance to the advancement of the disease and prevent the involvement of other organs. In my hands and in my observation the surgical treatment of tubercular diseases about the vesical neck is distinctly harmful.

CASE II.—E. J. H., aged twenty-four, came from the northern part of the city to the clinic over six months ago. He is fairly well nourished, is occupied as a teamster, and is without anything in his family history bearing upon the present question of the nature of his disease,

except that he states that he had a sister who died at the age of eighteen with pneumonia and a severe cough. He declares that he has never had any inflammatory disease of the urinary organs, and states positively that he never had gonorrhœa, which statement is borne out by the physical examination.

Three months before coming to the clinic he began to observe that he passed his urine more frequently than normal. This frequency of urination gradually increased until he was passing it every one and one-half hours during the day, and rising to do so as often as twice each night. About three weeks before coming here for advice, he noticed not only that the frequency was very great, but also that there were a few drops of bloody urine extruded at the end of urination. He consulted a physician, who, suspecting stone, sounded him,—rather roughly, he thinks,—causing increased bleeding and an increase in all his vesical symptoms. When he came originally he was passing his urine every half-hour, and had to leave the clinic-room several times for that purpose. He noticed also that he was more apt to bleed when he was compelled to restrain the desire to urinate,—which means that the more his bladder was stretched, the more apt he was to have hemorrhage.

Physical examination of the uro-genital organs showed some shot-like nodules in the mediastinum testis. One large lump, woody in its feel, could be made out distinctly in the head of the left epididymis. The vasa deferentia on either side were perfectly smooth, and the cords, as far as they could be reached, normal. The prostate, felt through the rectum, showed nodulation, and in the angle between the seminal vesicles at the prostatic base there was a hard mass, evidently between the bladder wall and the rectal wall, being attached to neither. The prostate was not tender or enlarged, simply showing hardened foci in the otherwise soft prostatic mass. The patient had never noticed that there was anything wrong with his testes. It was the frequency of urination and the pain in the act, especially at the end, which brought him here. The urinary examination made at the time showed an acid reaction, specific gravity 1022, hæmaturia, a few small clots in the first urine passed, and considerable cloudiness to the naked eye.

A tentative diagnosis of tuberculosis of the prostato-vesical region with tubercular nodules in the testes was made, and an order given to search the urine for tubercle-bacilli. These were found in abundance on a number of occasions. It must be also noted that at no time has there been evidence of any renal disturbance or any pulmonary disease in this case. The prognosis not being favorable enough to suit the



patient, he consulted another physician, who washed out his bladder, thereby very greatly increasing the pain, the frequency of urination, and the bleeding. Another physician was consulted, who, being told of the diagnosis made here, also examined the urine for bacilli and found them.

All instrumentation was prohibited, the patient was asked to secure more sedentary employment, and he was put on general anti-tubercular treatment. The improvement in his general health was marked. The hemorrhage and frequency of urination diminished greatly, so that now he is able to hold his urine for four hours. He gets up once at night. The bleeding has diminished to such a degree that the urine has now only a slightly smoky appearance to the naked eye. Blood-corpuscles—both white and red—can always be discovered in the urine, with more than the normal amount of necrotic epithelium. After about five months of treatment received here the patient has gained but very little. The symptoms show an improvement in the condition of the mucous membrane in the prostate and about the vesical neck. To the touch per rectum, however, no great change can be perceived in the state of the prostatic-vesicular region. The nodules in the prostate and in the testes remain about the same.

CASE III.—S. M., aged forty-six, married, is a travelling salesman, whose family history is excellent, and who esteemed himself a remarkably healthy man. He has been under observation for seven years. About two years before I first saw him he had gonorrhœa, the acute stage of which lasted nearly a month. The disease evidently extended behind the compressor urethræ muscle, and set up a cystitis of the neck, which has never become well. This man has been troubled ever since with frequency of urination, dysuria, and occasional hemorrhage. He has been sounded numberless times for stone, with a negative result.

When he came to me first he presented all the characteristic symptoms of a cystitis of the neck. His testes were sound and have always been so. His kidneys were sound. His lungs were sound. An examination by the rectum showed his prostate to be enlarged perhaps to double the normal size, nodulous, irregular in outline and in consistence. The seminal vesicles were knobbed. Two hard masses about the size of a pea were to be made out in the angle between the seminal vesicles. Another one was on the outer side of the patient's right seminal vesicle. The hemorrhage was irregular in character, but was considerable at times. Very few clots appeared then. Instrumentation aggravated the symptoms in the highest degree, so that it was

quickly abandoned. Tubercle-bacilli were found in moderate amount in the urine. Evidence of renal disease has never been discovered in the urine and is not to be found to-day.

Let me note right here that, so long as this patient's urine remained free from evidence of decomposition in the urinary passages, it was not difficult to make out the characteristic bacilli. Since this decomposition set in we have not been able to discover a single bacillus on the most careful search. This has been our constant observation in those cases which were observed long enough to determine this point.

In spite of the best treatment which we could give him, the disease has slowly but steadily advanced. The mucous membrane about the prostatic-vesical region evidently became more and more involved in ulceration, the hemorrhage increasing so as to permit blood-clots to accumulate in the prostatic sinus, causing frightful vesical tenesmus, which could be controlled only with opiates. All the prostatic-vesical region gradually became involved in the tubercular process. Finally, four years ago, it was thought best to attempt to relieve the hemorrhage and tenesmus by a median perineal section with curetting. This, however, so far from relieving symptoms, evidently increased them. The result you see in part to-day. The perineal wound has never closed; the urine being let in to the tubercular foci by the incision has hastened the tubercular process. There was great difficulty in restraining the hemorrhage for the first two weeks after the operation. The catheter for drainage could not be borne. Morphine hypodermically to the extent of profound narcosis alone sufficed to arrest pain and bleeding. The result of the tubercular process, as you see it to-day, is lamentable enough. Tubercular ulceration has completely destroyed the prostate and the membranous urethra, and has burrowed anteriorly in the perineum until it has reached subcutaneously the perineo-scrotal angle, and here we find a fistula, the result of an abscess. The original wound is attempting to close at the skin, but this attempt results in building up only pale, flabby, weak granulation-tissues. The ulceration has also progressed backward behind the prostate until now, as you see, I can pass in a probe which touches my finger in the rectum. This patient passes some of his urine per rectum, some of it by the two fistulous tracts in his perineum. A very little escapes by the urethral meatus. When his bowels are loose, fæces and quite often gases escape by the perineal fistulæ as well as by the urethral meatus. It is worth while noting that, in all this time, the vesical wall does not seem to be involved to a great extent. The patient's bladder will still hold six or eight ounces of urine, not all of



which is voided, for on introducing the catheter we find still remaining about two ounces of residual urine. The sphincter vesicæ seems still to be fairly good, though the compressor urethræ must be utterly destroyed. When the patient's bladder fills to a certain extent, the urine escapes involuntarily.

I would remark, in passing, that this patient is the father of four children, two of whom give evidences of surgical tuberculosis, one has hip-joint disease, and the other tubercular peritonitis.

CASE IV.—J. H. C., aged thirty-five, is a farmer, married, of rather delicate physique, the father of two children. He states that he has never had urethritis, and never received any injury to the urogenital organs. He has a family history of tuberculosis.

He states that four years before I first saw him he observed that he was passing his urine more frequently than usual. This frequency has gradually increased up to the present time. One year before that he noticed blood in his urine. While carrying a load of hay into a neighboring village he stopped on the road to converse with a friend. He observed at the time that he wanted to pass his urine, but waited for nearly an hour, thus distending his bladder more than ordinarily. On voiding his urine he discovered blood in it. Hæmaturia has occurred at intervals since that time, generally following over-distention of his bladder from the retained urine, as it did upon the first occasion.

The urine-record kept at the hospital shows no evidence of renal trouble; no evidence of pyelitis; no decomposition; no pus; blood-cells in small amounts; acid reaction. Eight sediments were examined without finding tubercle-bacilli. Physical examination revealed nothing abnormal except in the prostato-vesical region. Here there was one hard nodule, apparently in the vesical wall in the median line just posterior to the upper border of the prostate, and another in the left prostatic lobe near the base posteriorly. The bulbous sound caused slight bleeding in the prostatic urethra. Instrumentation increased the frequency and pain in urination. The patient had been sounded for stone several times, with a negative result, but always with an exacerbation of the symptoms. Cystoscopic examination was difficult, on account of the hemorrhage produced about the vesical neck, but there appeared to be an increased redness and injection of the smaller vessels about that region. No dark patches were discoverable. The stream in micturition was full and the detrusor acted normally.

There being some doubt about the tubercular nature of the inflammation, at the urgent solicitation of the patient a median perineal incision was made and drainage maintained for four days. No benefit

whatever resulted. On the contrary, I believe that the operation has hastened the pathological process. The wound has never closed. The patient voids his urine about once in two hours during the day, as before, and he estimates that about one-fifth of it passes through the perineal opening. It is evident that the attempt on the part of nature to close the wound is most vigorous at the cutaneous end. The small opening surrounded by pale, unhealthy granulations is narrower than any other part of the fistula. The probe passes into a pocket which runs back behind the prostate evidently to about the middle part. There is not much tissue between the point of the probe in this pocket and the finger in the rectum. There is some slight burrowing also anteriorly towards the bulb, and the probe easily reaches a sound lying in the urethra. It is very evident that we have not improved this patient's condition by letting the urine out of the urethra into the tissues already involved in the tubercular process. We can now discover tubercle-bacilli in the urine which issues from the perineal opening. In a word, we may say that the tubercular ulceration has been hastened by moistening the tuberculous areas, just as we know that the pathogenic micro-organisms grow more rapidly in the culture-media which have been kept more moist by the addition of glycerin. I cannot avoid the conviction that the tubercular ulceration has been hastened in this case by letting the urine flow outside of the urethra.

Here, again, our only hope is in anti-tubercular treatment. All instrumentation, all local applications, curettings, etc., would but hasten the pathological process, thus extending the ulcerative action. Nevertheless, as far as an examination will determine, the disease is still confined to the prostatic and peri-prostatic region.

Other cases coming under my observation where operations have been done for relief of similar conditions, only serve to accentuate the lesson which we may learn from this case,—viz., that operative means are inefficient to cure, and are harmful just to the extent to which they moisten tuberculous areas with the urine.

CASE V.—To make a diagnosis in this case it will be necessary to bring to our aid all possible modes of examination and all our knowledge of anatomy, physiology, and pathology ; and, finally, we shall be able to arrive at a conclusion only by the process of exclusion.

John J. C., aged fifty-five, married, has two children, the youngest of which is fifteen years old. He is a healthy-looking man whose family and personal history are excellent. He has never had any serious disease, but was troubled with what he called "bilious fever"



about eighteen years ago. About seven years ago he had nervous prostration following upon hard work.

His present trouble began about four years ago. He first noticed pain of a boring character, with a feeling of distention behind the pubes. His urine was voided more frequently than before, and the dull pain, though constant, was greatest when he was compelled to retain his urine for a considerable length of time. This pain is never lower than the vesical fundus. He voids his urine now about five times during the day. Within the last year he has observed that he rises once during the night for that purpose,—generally at about three or four o'clock in the morning. Within the last four years he has had several attacks of hæmaturia, which were ascribed by his physician to malarial cause. In each of these attacks he has observed that he passed also some clots of blood, generally small and of irregular shape. He thinks the clots came with the first few ounces of urine voided.

There is some hesitancy in starting the stream, and it flows sluggishly. The energy of the detrusor gradually diminishes as the bladder is slowly emptied, until the stream falls perpendicularly from the meatus, then comes by drops, finally ceasing. When he has passed as much as he can by voluntary efforts, we introduce a catheter, and find that there is about an ounce and a half of residual urine. This last comes very sluggishly through the instrument, and the flow can be easily stopped by elevating the proximal end of the catheter, to increase again by lowering this end so as to get this siphon action. This urine, both that which is voluntarily passed and that which is drawn with the catheter, is limpid, of a pale straw-color, and entirely devoid of pathological evidences. Its specific gravity is 1022, the reaction acid, and there is neither pus nor blood present. No prostatic enlargement can be made out by rectal touch. The prostate, the seminal vesicles, the testes, and the cords are normal. Moreover, the urinary examination does not show any evidence of renal disorder. Firm pressure in the hypogastrium reveals slight tenderness. I may state at once that, since the patient has been under my observation, no pathological products and no tubercle-bacilli have ever been discovered, though search has been repeatedly made. The quantity of urine voided is very little, if any, above the normal. As revealed by the catheter the prostatic urethra is not at all increased in length. A short-beaked stone-searcher fails to discover anything in the bas-fond. When the point is turned upward, some tenderness is felt by the patient in the anterior vesical wall towards the fundus. A good-sized sound, No. 30 French, blunt, is not cramped in the prostatic sinus, but slips

easily into the bladder, exciting no unusual pain and no bleeding. The hæmaturia has always followed unusual distention,—*i.e.*, when the patient was so situated that he had to retain his urine for a considerable time after he first felt the desire (which is not urgent) to pass it, slight hemorrhage followed. There was also an increase in the pain.

Now, you see that, so far, the clinical history of the case, the description by the patient of his symptoms and feelings, and the physical examination give us three points: first, the pain about the vesical fundus, never lower, which is increased by distention; second, hæmaturia, also excited by distention; third, increased sensitiveness of the bladder wall towards the fundus and anteriorly on the use of the sound. On the other hand, it is clearly demonstrated that there is no prostatic obstructive disease. So much we can exclude, and so much it is necessary to exclude, because this patient has reached the period of life where prostatic enlargements causing obstruction and some of the symptoms which this patient has are likely to occur. Bleeding and interference with urination may easily be caused by even a small sub-mucous fibro-myoma springing from the prostatic base. If such were the case, however, we should expect that urination during the night would be more frequent. Such a patient would rise more than once during the night, and the bladder interference ought to be greater than it is here. There should also be in such a case some cystitis mucosa. The residual urine is evidently the result not of a prostatic obstructive disease, but of some pathological interference with the detrusor vesicæ; and, too, the pathological process is most likely situated in the middle or muscular coat, not involving to any considerable extent the mucous membrane, certainly not to the extent of making an inflammation, else there would be pyuria. The urine, which has now been standing some time, shows very little, if any, increase in the normal mucous cloud. The hemorrhage, when it occurs, evidently comes from the vesical fundus and only when the viscus is stretched. The bladder will only hold about six ounces of urine without discomfort.

Even now it is evident that we have to deal with a diseased condition existing in the vesical parenchyma, and which must have reached this location from some other source than from the urethra, the prostate, or the bladder cavity. It seems possible also to exclude papilloma vesicæ, because in such a disease hemorrhage would be a far more prominent—in fact, the most prominent—symptom. In such cases, where the disease had existed as long as four years, there would be not only considerable hemorrhage but evidences in the urine of a cystitis,



even though the growth were situated towards the fundus. Calculous disease of the bladder is easily excluded; nor would the symptoms raise serious suspicion of a stone. Malignant disease would long ago have developed not only different symptoms, but also a very different general appearance, if it had not already destroyed life.

In such a case as this, to be able to have a view of the vesical interior is of paramount importance, and such a view will be afforded, indeed has already been afforded, by the cystoscope. Cystoscopic examination reveals a normal interior about the vesical neck. The ureteric orifices are easily distinguished and are normal. Nothing abnormal is discovered about the trigonum, about the vesical floor posteriorly, or on either side; but when the instrument is pushed well in and turned so as to obtain a view of the anterior vesical wall, then for the first time is observable a pathological alteration. Here we see, over a space perhaps larger than a silver dollar, irregularly distributed dark patches, spindle shaped, lying, curiously enough, transversely. They are irregular in size, the central ones being the largest. They diminish in size towards the periphery of the patch. The central ones appear to run together in places, the peripheral being more distinctively separated. As the cystoscope is turned from side to side, it is observed that the vessels are less and less injected as we go farther away from the patch. The bladder wall intervening between the peripheral patches or smaller ones seems in some places to be almost, if not quite, normal. The closest scrutiny I can make with this instrument, even in the central portion, shows no involvement of the epithelial structure. I can make out no erosion. The fundus posteriorly is normal.

Now, with the evidences before us, we seem to be forced to the conclusion that we have here a slow-moving pathological process existing in the muscular layer, certainly beneath the mucous membrane, in the anterior and upper wall of the bladder. The etiological factor must have reached the parts affected either from the peritoneum, from the lymphatics, or from the blood-vessels. We have no evidence whatever that this causative factor entered by way of the bladder cavity. There is nothing in the intelligent history given by the patient to indicate a previously-existing peritonitis. It is more than probable that the avenue of infection was through the hæmatic channels. This inference, together with the evident fact that more than one point was affected,—that, in other words, the process is a disseminated rather than a diffuse one,—together with the additional evidence we have of the essentially chronic course, in my mind justifies the diagnosis of

*localized parenchymatous tubercular cystitis.* Moreover, the pathological process seems to be slowly advancing in the direction of the mucous membrane. Sooner or later there will be such an interference with the sub-mucosa as to bring about nutritive changes in the epithelial coat, resulting in an exfoliative localized cystitis. Then we may expect an increase in hemorrhage and ulceration. When this occurs we shall be likely to find tubercle-bacilli in the urinary sediments. As it is now, we cannot expect to find them. If the tubercular patches break down in their centres, or if there be a mixed infection,—the addition of any pyogenous micro-organism,—abscess in the vesical wall will form. I should expect in this case to see the evidences of hæmaturia before pyuria. It is quite likely, considering the distinct interference with the action of the detrusor muscle, that more of the bladder parenchyma is involved in the pathological process than is visible from the vesical interior. It is not impossible that there is some localized tubercular peritonitis.

This patient has been for a short time on anti-tubercular treatment. He is taking a preparation of malt with the hypophosphites, to which are added five-drop doses of beech-wood creosote. He believes that his condition is improving, though the time during which he has been under treatment is far too short to draw conclusions. Indeed, we cannot be absolutely positive about the diagnosis. He will be kept under observation for a long time, the cystoscope being used at intervals of a month to discover, if possible, any changes that may go on in the pathological area. We shall also not fail to make frequent examinations for pathogenic micro-organisms.

[*Later Note.*—June 16. Tubercle-bacilli were found in this patient's urine by Dr. F. A. Winter.]



## TUMORS OF THE BLADDER.

CLINICAL LECTURE DELIVERED AT THE BOSTON CITY HOSPITAL.

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GENTLEMEN,—Within the past ten or twelve years the subject of bladder tumors has assumed a most important place among the chapters of surgical diseases, and our knowledge of this class of cases, and especially that relating to their treatment, has, practically speaking, been born within that period. An extensive series of data and a voluminous literature are at this time accessible and furnish a wide basis for an intelligent survey of the subject.

Of the causation of these growths we know but little. The following observations may, however, be noted:

1. Males are affected more than twice as often as females.
2. With the exception of myxoma, all forms of bladder tumors occur more frequently after the age of thirty-five. Carcinoma occurs much more frequently after fifty years of age.
3. Two-thirds of all bladder tumors occupy the lower half of the organ.
4. A favorite site for papillomatous growths is that about the orifices of the ureters.

Pathologically these growths may be classed as follows:

Of *benign* growths we have: 1. Papilloma; 2. Myxoma; 3. Myoma; 4. Hydatid cyst; 5. Dermoid cyst; 6. Adenoma; 7. Angioma.

Of *malignant* growths there are: 1. Carcinoma—(1) flat-celled, (2) glandular. 2. Sarcoma—(1) myosarcoma, (2) spindle-celled, (3) round-celled, (4) lympho-sarcoma.

Benign growths occur more frequently than malignant ones. Papilloma is the most common form of all, carcinoma is the next.

Sir Henry Thompson describes a form of growth which has not the characteristics of the papilloma on the one hand or of the carcinoma on the other, to which he gives the name of "transitional intermediate growth," and considers that it is a papilloma undergoing change into a malignant tumor. Harrison reports also a case of Paul's which gives clinical support to the theory of the gradual change from benign to malignant. In that instance the growth was extirpated several times, always being of a benign character, until at the end of ten years when it became malignant. Guyon combats this theory, but brings but little proof to contradict it.

**BENIGN GROWTHS.**—The term "papilloma" is applied to a growth which is benign throughout. Any of the varieties of tumor mentioned above may have a papillomatous (villous) surface, which tells nothing of the nature of their base, which may be malignant or benign. Papilloma may be either single or multiple, sessile or pedunculated; in the latter form the pedicle varies greatly in length and thickness. A frequent form is that in which there is a well-defined pedicle, the summit of which divides into several heads, each covered with a dense mass of finger-like projections (*papillæ-villi*). A less common variety is that in which a quantity of delicate, thread-like *papillæ* spring separately from an ill-defined base.

Structurally the papilloma consists of a base of connective tissue and muscular fibres derived from the submucous coat of the bladder, but the growth does not penetrate the latter or tend to invade it more deeply. From this base spring the individual *papillæ*. Each one of these consists of a central loop of thin-walled capillary blood-vessels, supported by a frame-work of delicate connective tissue, which is covered externally by one or generally several layers of epithelial cells of the columnar form which have large distinct nuclei. It is from the tearing off or necrosis of these friable *papillæ* that the blood, which is the most characteristic sign of the presence of the growth, comes. If there is a preponderance of connective tissue and but slight papillary formation in one of these growths, it becomes more nearly a true fibroma. To such forms Sir Henry Thompson gives the name of "fibro-papilloma."

Myxoma is most frequently observed in childhood,—it used to be called polyp. It is essentially a fibroma which has undergone mucoid transformation. It is usually a single growth, but often has several heads. If there be but little connective tissue present its appearance is gelatinous. It often resembles the nasal polyp. There is generally a well-defined pedicle.



Myoma is a single growth which sometimes attains a large size: it has been observed of the size of an orange. It is made up of connective tissue and unstriated muscular fibre. A moderate tendency to pedicle formation exists.

Dermoid and hydatid cysts have been in one or two instances observed, and one case of adenoma and one of angioma are recorded. Of all tumors papilloma is the one most commonly encountered. The other varieties occur, as to frequency, in the order above named.

**MALIGNANT GROWTHS.**—Of these carcinoma is the commonest. It is met with in two forms in the bladder,—(a) as the flat-celled and (b) as the glandular variety. Clinically speaking, it may be scirrhus or encephaloid. The growth is single or multiple, sometimes pedunculated and sprouting into the bladder cavity, again appearing as an ulcerating surface, with indurated base and edges, the latter raised and everted, the surface covered with ragged necrotic tissue. In structure these growths consist of a connective-tissue intercellular substance, in the spaces of which lie irregularly-shaped cells, sometimes packed together in a typical cell-nest form. The growth extends inward to the deep structures of the bladder, and has the characteristic tendency to destroy contiguous tissue by direct extension. The percentage of cases, however, in which the disease involves the neighboring organs and tissues outside the bladder is comparatively small. A marked feature of cancer of the bladder is that it remains localized for very long periods, and that its course is exceedingly slow in many instances. This peculiarity is probably due to the scarcity of lymph-channels in the bladder and to their anatomical distribution, which does not favor infection. Cases are recorded of cancerous disease of the bladder of seven and thirteen years' duration before death ensued. Secondary deposits are found in other organs in about one-quarter of the cases of bladder carcinoma.

Sarcoma is among the rarer forms of bladder tumors, but of late the number of well-authenticated cases reported has been considerably increased. Hinterstoisser in 1890 collected more than twenty cases, and Hurry Fenwick has recorded sixty. This growth occurs somewhat oftener in women than in men. It is single, and usually progresses rapidly.

In about one-third of all cases of bladder tumors secondary changes in the form of hydro- or pyonephrosis occur in the kidneys.

**Symptoms and Diagnosis.**—The cardinal symptom of bladder tumors is hæmaturia, which has in a general way the following features to distinguish it:

*Abundance and Spontaneity.*—As a rule, the bleeding from these

growths far exceeds in quantity that arising from any other condition in the genito-urinary tract. It is sometimes so excessive as to fill the bladder with clots, and to cause urinary retention and painful vesical tenesmus. Exceptionally it is slight in quantity, and may be even wanting throughout the course of the disease. It takes place independently of exertion; sometimes the worst hemorrhages occur during sleep. The hæmaturia is usually intermittent, exceptionally it is constant after the first attack. The frequency of the attacks, if intermittent, progressively increases. If the hemorrhage be profuse, the blood colors the whole quantity of the urine passed during an attack bright red. If drawn with the catheter the latter half of the stream will contain the larger quantity of blood. The urine is not colored a smoky brown or greenish brown, as it is by blood arising in connection with some forms of kidney-disease. In a few exceptional instances of stone in the bladder, of hypertrophy of the prostate, equally abundant hemorrhage may occur. Guyon mentions one case also of gonorrhœal cystitis in which there was profuse bleeding; renal calculus and cancerous disease of the kidney are also occasionally associated with profuse bleeding. In these latter cases the history will, as a rule, give the clew to the origin of the bleeding. The most difficult condition to differentiate it from is tuberculous disease of the bladder or kidneys associated with bleeding. As a rule, in this disease the bleeding is not abundant, and it is generally associated with marked irritability of the bladder, and sometimes the discovery of tuberculous deposits in the testis, epididymis, or seminal vesicles, or of tubercle-bacilli in the urine, clears up the matter. In tuberculous disease hemorrhage, if present, is apt to be more marked early in the disease and to become less as the disease progresses, the reverse being true in the case of bladder tumors.

*Pain and Bladder-Irritability.*—Pain as a symptom of bladder tumors is not especially characteristic of the affection, except that, unlike that in connection with stone, it is not increased by movement. In cases of benign growths pain is apt to be preceded by hemorrhage,—in malignant tumors it is apt to precede or accompany the first attacks of bleeding. The pain may not exceed, in the case of benign growths, a mild bladder irritability. If the growth be situated near the vesical orifice, the stream of urine may be suddenly stopped, the stoppage being accompanied by a stinging sensation along the urethra, and generally more or less bright blood in the latter part of the stream. In the case of malignant growths pain sooner or later becomes a prominent symptom. It is then often characterized by being radiating in



character, shooting down the thighs or into the sciatic regions. Exceptionally pain may be entirely absent.

Frequently bits of the surface of a bladder tumor are passed out in the urine. If they are large enough, they are noticed by the patient as fleshy lumps. If such a piece be passed in a fresh state it will often present at once to the naked eye the characteristic finger-like processes floating off from the surface. Often in the sediment of the urine small bits if fresh are absolutely characteristic upon microscopic examination; and even when the cast-off papillæ have become necrotic, they may still preserve the branching finger-like form sufficiently to allow the diagnosis to be made from them. When such bits exist in the urine they furnish proof positive of the existence of a bladder tumor, but further tell nothing positively as to its nature, as a rule.

Even when these fragments of the growth are not passed, the presence of a bladder tumor is strongly suggested if the urinary sediment be found to constantly or frequently contain in large quantities polymorphous epithelial cells (among which, as a rule, the spindle or crescentic shapes predominate) with large nuclei.

The further steps in reaching a diagnosis are palpation, sounding the bladder, digital exploration, and cystoscopic examination.

If a large, dense growth exists, or if a cancerous growth has infiltrated the base or the posterior wall of the bladder, it can generally be appreciated by rectal or bimanual palpation, otherwise it will probably escape attention by this means.

I consider it injudicious to use a sound or sharp-eyed catheter, or any similar instrument, in the bladder for the purpose of detecting the presence of a tumor. The sound will probably fail to appreciate any growth that is not large, dense, and salient. The use of catheters for the purpose of detaching a bit of the surface is likely to be followed by a sharp hemorrhage, and one or two fatal results have occurred in this way; furthermore, the bladder in such cases is particularly prone to cystitis upon slight interference.

The modern cystoscope, originated by Nitze in 1879, and since then improved by him, by Leiter, and others, has gradually acquired an assured position as an instrument of value for diagnostic purposes in obscure cases of disease of the bladder. I cannot agree with its most enthusiastic admirers in their assertion that it covers completely the whole question of diagnosis of bladder troubles that are in any way obscure, and that it is practically all that is needed for this purpose, nor, on the other hand, do I think it by any means a useless instrument. With regard to its value in certain cases of stone, I have in

this connection nothing to say. But let us suppose a case in which there has been hæmaturia or some disturbance of micturition, and a urinary sediment which contains the cells of the sort and in the manner described as being suggestive of a bladder growth, but beyond this we are at fault in the diagnosis; the cystoscope may often, in such a case, give conclusive proof of the presence or absence of a bladder tumor. Or, if we are already certain of the existence of a tumor, the cystoscope, under favorable circumstances, may inform us as to its exact situation, size, form, etc. The drawback to the advantageous use of the cystoscope is that the interior of the bladder sometimes cannot be sufficiently freed from blood or pus to give the clear fluid medium necessary to allow of a satisfactory view, and, unfortunately, this is most likely to be the case in precisely those instances in which the cystoscope is most desired to clear up the diagnosis. When hæmaturia alone is present, however, except when it is abundant and constant, a satisfactory view with the cystoscope can usually be obtained during a period of intermission of the bleedings, and if a moderate bleeding be excited by the introduction of the tube, it can usually be checked by prolonged irrigation with cold water, or, this failing, with very hot water. This, however, is not always possible. I have recently had two cases in which, on several different occasions, and once in each when anæsthesia was employed, a brisk hemorrhage took place into the bladder as soon as five ounces of fluid were injected, and always rendered the cystoscope useless. Again, in old trabeculated bladders, especially if a pyonephrosis coexist, it is sometimes impossible to clear the organ of pus sufficiently to get a good view. In many cases, however, of bladder tumors, if the examination be undertaken in the period of intermission of the bleeding, the injected fluid or a clear urine will allow an excellent sight of the growth and its character, and much assistance may then be obtained.

For the successful employment of the cystoscope the following conditions are requisite,—viz.: 1. Clear fluid contents of the bladder. 2. A capacity of at least five ounces. 3. A clear urethra,—that is, one which has no stricture, or such form of prostatic hypertrophy as to render the passage of the tube impossible.

The cystoscope which I prefer is that of Leiter or of Hurry Fenwick, which I use in connection with a small six-cell battery made by Schall & Co., Wigmore Street, London, England.

In using the tube the following rules, which are laid down by Fenwick, should be observed,—viz.:

1. Test the lamp previous to use.



2. Use the tube with the window on the lower (posterior) surface of the beak first.

3. Do not turn on the current until it is certain that the beak is well within the bladder.

4. Do not allow the beak to rest at any time against the mucous membrane of the bladder. A momentary contact will not scorch the surface touched, but if it be prolonged, even when the tube is immersed in fluid, this accident is likely to occur.

5. Before withdrawing the tube shut off the current and allow at least one minute to elapse in order to give time to have the beak become cool.

6. Inject at least five ounces of fluid into the bladder. A less quantity gives too little room for examination and allows a greater chance of the mucous membrane being scorched.

7. Clear urine or water in the bladder are the best fluid media for examinations.

8. If hemorrhage be excited during the examination and persist after several washings of the bladder, further examination had better be postponed till another time.

9. If the urethra or bladder be especially sensitive, an anæsthetic should be used ; otherwise, the examination can be made without it.

The first appearance presented to the eye through the cystoscope within the bladder is that of an indefinite yellowish-red color. As the window is pushed near to the mucous membrane the latter is soon easily differentiated, its rugæ and folds made clear, and its blood-vessels can be discerned ; by careful search about the base the orifices of the ureters can generally be made out ; if there be pus or blood flowing from them they can be more readily made out by the rhythmic ejection of these fluids, which create a little current in the vicinity of the ureteral mouths ; if blood be thrown out its dark stream is especially conspicuous ; in either case this appearance locates a trouble in the kidney, whatever may be the condition of the bladder in addition. It is not uncommon at first for the novice to mistake the vesical orifice for a bladder tumor. The vesical orifice comes conspicuously into view when the tube which bears the window on its upper side is withdrawn until the window is close to the internal vesical sphincter, which is seen as a dull-red or black body of an irregular contour. Its nature at once becomes evident upon rotating the tube, when it will be seen to have a circular though irregular outline.

The appearance of bladder tumors is difficult to describe. In favorable conditions it can be decided whether the growth is peduncu-

lated or sessile, or is represented by an ulcerated surface. When the latter is seen to be the case, and when it has raised ragged edges or when the latter look œdematous, the probability is that it is of a cancerous nature. The fine villous projections of a papilloma often give a most characteristic and beautiful picture. The position and extent of the growth also can often be made out accurately. The condition most likely to be mistaken for a bladder tumor is a projecting portion of a hypertrophied prostate; and this is especially true when its surface is ulcerated and occupied by granulation tissue; the position of the growth, the detection by rectal touch of an hypertrophied prostate, and the history of the case will usually make its nature clear. It sometimes happens that the surface of a bladder tumor is incrustated with phosphatic salts, which has very likely given rise to an erroneous diagnosis of stone; the cystoscopic examination may then be of great use in revealing the nature of the condition, part of the surface at least being generally exposed, or it being possible to free it by striking it gently with the tip of the tube. The accompanying illustrations (Figs. 1 and 2) give an idea of the appearance of some bladder tumors.

FIG. 1.

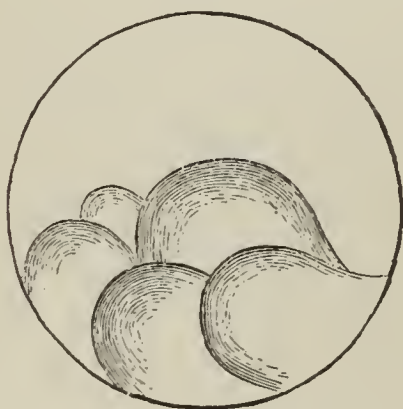


FIG. 2.



The last step in the diagnostic series is digital exploration through an external perineal urethrotomy. In 1883, Sir Henry Thompson proposed to utilize such a perineal opening in the urethra for purposes of diagnosis in cases whose nature still remained obscure after the usual means of investigation had been exhausted. The opening into the urethra at its membranous portion is to be made in the usual way on a grooved staff, and should not be larger than to give admittance to the finger into the bladder; the posterior urethra is rapidly dilated by large sounds, then the little finger is passed, and finally the index finger. Ordinarily the whole of the last phalanx can be made to enter the bladder readily (the bladder should be empty or nearly so); when the tip of the finger is well within the vesical sphincter, the other hand or the hand of an assistant makes strong counter-pressure above the



symphysis pubis upon the summit of the bladder. If at the same time a series of rotatory movements be made by the hand above, the inner surface of the bladder can be made to pass over the tip of the examiner's finger within, so that its entire extent can be felt. The exploration of the base is often rendered easier by lifting it upward by a finger in the rectum. To a long finger with a delicate tactile sense even very slight structural changes will become apparent, and if the whole inner surface of the bladder can be felt, a tumor will rarely escape detection.

The conditions which render a digital examination fruitless are a narrow outlet to the pelvis, or such forms of prostatic hypertrophy as lengthen the posterior urethra, which are always associated with any considerable enlargement of both lateral lobes.

Digital examination has the disadvantage as compared with cystoscopic examination that it necessitates the making of a wound. This Sir Henry Thompson considers to be but a slight drawback, and that it is often offset by the advantages of furnishing good subsequent drainage, which is desirable in some cases ; and, secondly, of accomplishing the first step in the operation for such tumors of the bladder as allow by their size, situation, and form of successful removal through such a perineal wound, while if the growth be not readily removable through the perineal wound, the presence of the latter does not in any way interfere with the immediate performance of the supra-pubic operation.

The position that digital exploration as a diagnostic measure should assume is, it seems to me, that of the last step, others having failed, to establish the nature of the trouble decisively.

The next time, gentlemen, we shall consider the *treatment* of bladder tumors.

## SYPHILIS.

CLINICAL LECTURE DELIVERED TO THE SENIOR CLASS OF THE ST. LOUIS COLLEGE  
OF PHYSICIANS AND SURGEONS.

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### SYPHILIS OF THE TONGUE.

THE patient before you, as you see, is a woman, who is about fifty-three years old. She states that her tongue is painful when she speaks and eats. Upon first glance (Fig. 1) it might be taken for epithelioma, as it presents a peculiar worm-eaten appearance, extending along the right border, almost from the tip to the root of the organ. A little secretion covers it. It is rather reddish and angry-looking, but upon interrogation we learn that it has existed for a year without material change either in appearance or feeling. Upon further questioning we find that the patient had an eruption of a papular character, which neither pained nor itched, and which occurred upon the wrists, back of the neck, and possibly upon other portions of the body. For this she was given internal treatment, having been under the care of several physicians. An inquiry into her domestic relations (for she is a married woman) reveals the fact that some two years ago she had a quarrel with her husband, and after this little breach of domestic peace the latter acquired some trouble, not defined, "from a water-closet." This is sufficient in my mind to determine the nature of the trouble, which could only be mistaken for one other, epithelioma. The fact, however, that it has existed for a year without any material change, that it was preceded by an eruption, which was treated constitutionally, and that the husband evidently presented the lesions of some venereal trouble, suffice to make a diagnosis of syphilis.

In addition to this, the objective symptoms presented by the lesion might also serve to distinguish it from a malignant process. We find that the tongue is not indurated in that peculiar manner which is so





Fig. 1.—Syphilis of the Tongue. Showing appearance before treatment.



Fig. 2.—Syphilis of the Tongue. Showing the results of treatment.





characteristic of epithelioma. The secretion is not so abundant, nor has it that foul character which we should naturally expect to find in a malignant process which had existed for a year. Moreover, the destruction of tissue is very small, and, as you are well aware, epithelioma, while not rapid in destroying tissues, still is progressive, and the loss of tissue increases *pari passu* with the length of time which it has existed.

A factor which might lead to error is the patient's reference to pain upon moving the organ, but you will find that this is frequently an accompaniment of destructive processes occurring in mucous cavities, whether due to syphilis or to any other cause. This glossitis constitutes one of three varieties which we meet in syphilis. We have superficial glossitis (of which this is an example), interstitial glossitis, and deep glossitis, the two latter being evidences of late syphilis due to gummatous tumors occurring in the connective or muscular tissue of the organ, while the former is a transitional variety, and might be regarded as the connecting link between the mucous patch and the ulcerated syphilide. The ulcerative process is rather superficial, and has no tendency to dip down into the tissues, whereas in the interstitial variety a condition exists in which the destruction follows the course of the connective tissue and spreads in the direction of least resistance, while in the deeper variety of glossitis we have the gumma, which, as is usual with those neoplasms, breaks down, ulcerates, and forms a cavity connecting with the upper surface of the tongue, and exudes a fetid, thick, mucilaginous secretion.

The age of the disease is also an indication in regard to the variety which is represented, and this is the more valuable as it gives us a hint as to what are the proper remedies which are to be adopted in such a case. In view of the fact that it is in the transitional stage, and, further, that the woman has already been subjected to internal treatment, the proper course to be pursued in this case is to give for general treatment the mixed form, and for local treatment such as will hasten cicatrization and a return of the morbid process to the normal in as rapid a time as possible.

In the local treatment of these syphilides, as in that of all the destructive processes incident to syphilis occurring upon mucous membranes, you will find that cauterizing agents are probably the most valuable. They not only act as stimulants, but they have also the further action of destroying the neoplastic tissues which have formed, and of bringing the tissues nearer to a normal state, and consequently to a condition more favorable to the reparative process.

In this case we shall touch the entire edge of the diseased portion

of the tongue with pure carbolic acid. While this is somewhat painful, you will find that the acid possesses analgesic properties of its own. It is painful for a short time only, and then follows a comparative loss of sensation. It is superior to other agents, from the fact that it does not induce the formation of crusts, but rather a resolution and resorption of infiltration and a return to the normal. In mucous patches this is a valuable remedy, as is also nitric acid, which, while it may seem a very severe method of local treatment, is probably one of the best. As you are well aware, mucous membranes are not so sensitive as is the integument, and these strong cauterizing agents are not so acutely felt when applied as they would be were the process one involving the skin, and the results which follow are so good that we are perfectly justified in adopting them. You will find that, in mucous patches involving the buccal mucous membrane, one application of nitric acid made superficially will be followed by much better results than a number of applications of nitrate of silver or other superficial cauterizing agents of this nature, whose tendency is to induce the formation of crusts, under which ulceration or suppuration may take place. Agents which act in a similar manner to nitric acid are pure carbolic acid (such as we used in the present case), creosote, the acid nitrate of mercury in solution, etc.

In the general treatment, as I have already said, the mixed form is essentially indicated; and, as you are well aware, this consists in the joint use of mercurials and iodides, which may be combined in such various ways as to embrace many modifications, but which for our present purpose we put in the following form:

℞ Hydrargyri bichloridi, gr. ii;  
Kali iodidi, ℥ iv;  
Aquæ, f ℥ iv.—M.

Sig.—A teaspoonful in water after each meal.

When all this has been taken the iodide will be increased in quantity, still retaining the same quantity of mercurial, and in the third prescription the mixture will be so modified that there will be one-half of the mercurial and three times the amount of iodide contained in the original formula. The idea is to produce as rapid change as possible with the least amount of gastric disturbance, and, in order to insure this latter, when the iodide of potassium is markedly increased in quantity the dose should be administered in milk, as this has a tendency to reduce to a minimum whatever gastric disturbance might be brought into action by the iodide. You will find that when you are compelled to give large doses of iodide of potassium, milk is probably



the best menstruum that can be chosen to avoid the gastric disturbance incident to the absorption of the drug. You will also find that iodism, or the toxic action of iodine or its compounds, is much less likely to occur when you give large doses of the iodides than when you give small ones; and you will further find that it is a good plan to dilute your solutions largely, from the fact that they are less irritating locally to the walls of the stomach, and they are much less likely to run down into the bowels and produce irritation there and be thrown off; while dilutions also insure much more rapid absorption, and consequently a more rapid action of the remedy, more especially when soluble mercurials and iodides are given.

An important point, which should never be forgotten in connection not only with cases of this character but with all cases, is not to make a "snap" diagnosis. Do not make a diagnosis from a mere inspection of a portion of the body, but always make your inquiries, and direct them not in the line in which your bias might lead you, but in a general way, in order to discover the truth, not to confirm an idea. There is no doubt in my mind that nineteen out of twenty who are well acquainted with the subject would upon first inspection pronounce this case one of epithelioma, and yet it is rather a marked one of syphilis. You will occasionally find cases of syphilis of the tongue in which there is a well-defined induration and other symptoms which would lead you to form a diagnosis of epithelioma or other malignant process, more especially when, as is not the case in the present instance, the history is so obscure that nothing definite can be obtained from the patient, either through an unwillingness on his part or through ignorance. Where such cases occur, in which they are completely involved in obscurity, you will find it a good rule of practice to place them upon active anti-syphilitic treatment, and it is in such instances that this treatment becomes the "touchstone of diagnosis." It is here that the success of the treatment will confirm the diagnosis and unquestionably lead to a proper appreciation of the condition; not only that, but it will make you certain that the disease is not a malignant one, but a luetic one, and may possibly spare the patient a painful, useless, and dangerous operation,—excision of the tongue,—which should never be undertaken except as a last resort.

[*Later Note.*—The accompanying engraving (Fig. 2), taken five months later, shows the result of the treatment which was outlined. The whitish area seen in the picture is the thin, new mucous membrane. The patient is well in all respects, there being a complete absence of pain upon deglutition, speaking, masticating, etc.]

## CHANCRE OF THE THUMB.

The next case that I present to you has a lesion which is not common, and which is not often easily recognized unless some attention has been paid to the peculiar manifestations of the chancre in extra-genital localities. The patient is a married man about thirty-six years old, who furnishes a very unsatisfactory history in regard to his affection. He states that a little over a month ago he had a cut at the extremity of the right thumb, and that about a week ago he noticed the trouble which you now observe, and which is characterized by a mass of granulations having a great resemblance to condylomata acuminata. (See Fig. 3.) Upon touching this mass of granulations you will find that it bleeds easily, and upon palpating you will find that there is no

FIG. 3.



Fungating chancre of the thumb.

distinct induration to be felt. It is one of the characteristics of digital chancres that they very rarely become indurated. If you observe it closely, you will see that the nail is separated from its distal extremity half-way down through the matrix, but this may be explained from the fact that the patient presented himself to a physician who inserted a bistoury beneath the nail, for the purpose of obtaining pus, in which he ignominiously failed. So far as subjective sensations are concerned, there are not any, and upon interrogation we learn that there was some little pain in the arm a few days ago, but this has entirely disappeared. The part, however, feels somewhat sore, and, although no distinctly enlarged or indurated epitrochlear gland can be made out, the axillary glands

seem to be pretty distinctly implicated. While the lesion itself is a typical example of the so-called fungating chancre, the history would point to the cut as the point of infection. As to the manner in which this occurred, it cannot be determined. The man's occupation, that of a waiter, does not seem to furnish any probable indication, but that it was acquired from a syphilitic lesion of the primary or secondary period, which was secreting, there is no doubt whatever. There is no other possible way in which it could have been acquired.

This case opens up two very interesting subjects,—one of digital chancre, and the other of the extra-genital chancre. In regard to the



first, you will find that chancres upon the extremity of the thumb or finger are uncommon in comparison with the others. I have seen two other chancres of the thumb, which were in each case situated upon the side of the organ. You will find that, as a rule, digital chancres may be divided into four classes: First, the scaling papule or tubercle, which occurs upon the dorsum of the finger, and which is comparatively rare; second, the excoriated or exulcerated nodule, which occurs upon the side or dorsum of the finger; third, the fungating chancre, such as the one you see before you, and which occurs about the tip and around the nail; fourth, the panaritium-like chancre, which takes its origin at the nail-fold, as a rule, and simulates, to a certain extent, a felon. In all of these forms the want of distinct induration is the prominent characteristic. The excoriated nodule you will find is the most common of these, while the fungating chancre is not uncommon. The most common method of acquiring these lesions is by means of contact with the female genitalia, and it is on this account that the chancre of the finger has been denominated the midwife's chancre. You will find that physicians and midwives, as a rule, are those who are most liable to this form of primary lesion, and as soon as they acquire it they become dangerous members of society, unless they have sufficient knowledge or moral sense to be careful not to infect innocent individuals by the same means through which they were infected; and the cases are by no means rare in which a midwife has been infected, and in her turn has infected from twenty to one hundred individuals, either directly or indirectly, plying her vocation in spite of the fact that she was suffering from a distinct primary syphilide, and bore later on traces of a general syphilitic involvement in the form of the characteristic eruptions of the disease.

So far as extra-genital chancres are concerned, you will find that they are not so uncommon as one would be led to believe. As you are aware, a chancre may occur upon any portion of the body which is liable to come in contact with the syphilitic virus, and the methods, both immediate and mediate, by which the virus may be placed in contact with different portions of the integument are so many that it would be difficult to enumerate them unless a great amount of time were taken for that purpose. It is but the other day that I saw a chancre of the tonsil. I have seen chancres upon the hard palate, the gums, the lips, the anus, the ear, the eyelid, the nose, the pubes, and so on. When we take into consideration the fact that there are so many syphilitics who are careless; that they use so many utensils which others use, and which may have been imperfectly cleaned

or washed; that physicians will treat syphilitics and non-syphilitics with the same instruments, use the same diagnostic instruments upon both classes of patients; that individuals suffering from chancre of the lip, mucous patches, and so on, will not hesitate to kiss their relatives, and those who are not their relatives, it is sometimes a matter of surprise that extra-genital chancres are not more numerous than they are, and that more individuals are not innocently inoculated than we find in the course of daily practice.

The methods of infection in extra-genital chancre are sometimes very curious when they can be traced, but in the majority of cases it is merely a matter of conjecture; no positive evidence can be brought to prove that the disease was acquired in the manner in which it is supposed, although it seems the most reasonable in some cases. Where, for instance, a chancre of the lip exists upon the infecting individual and one upon the lip of the infected individual, and confrontation can be used, there is very little room for doubt; in fact, wherever confrontation can be employed, a more positive diagnosis of the method of infection can be made. Cases have been reported in which a pipe, a cane, chewing-gum, cigars, and so on, have acted as the media for transferring the contagion from one individual to another, but this has never been thoroughly established; whereas, in cases in which a Eustachian catheter has been the means, no doubt could exist upon the subject, simply from the fact that the physician who had used that catheter was certain that previous to inserting it into the tube of the healthy individual he had examined a syphilitic who had mucous patches of the Eustachian tube, and had forgotten to clean his instrument. In the same manner, when it is the midwife or physician who transmits the disease from one patient to another, there is the lesion existing upon the transmitter, followed by the appearance of the disease upon the patient, and the reasonableness of the method becomes very apparent and is clearly established. In cases of chancre of the tonsil, it is very difficult to determine the cause. It has been argued by some that in chancres of the buccal cavity in general the virus need not necessarily come in direct contact with the part which is involved, but that it may be conveyed by the saliva of an infected individual and be transported to some crypt of the mucous membrane, find lodgement there, and, if the ground be favorable, develop into a chancre. While this may appear very plausible, it does not explain all cases, and there are some cases of chancre of the tonsil, for instance, which have been directly referable to immediate contagion in individuals who were addicted to certain forms of debauchery.



The best treatment to pursue in a case of this character—that is, of digital chancre—is to protect the lesion from external influences and irritation, and endeavor to secure as rapid a return to the normal as is possible under the circumstances. As you are aware, the chancre has a peculiarity of being chronic, not healing readily, and the next best thing we can do is to favor its healing as much as we can; and for this purpose, in the present case, probably the best method to pursue would be to use a dressing of a solution of bichloride of mercury, say one in one thousand, and apply immediately thereafter dry calomel. This has a twofold object,—you secure a drying-up of the lesion through means of the powder which you apply, and you also secure a repression of the fungating mass, while the bichloride solution acts not only as antiseptic, but also as a local specific application, and has a tendency to repress any formation of pus which might occur. Besides this, the contact of the calomel with the bichloride brings into being a small amount of nascent bichloride of mercury, which is very effectual in its action. This means will not only prevent syphilitic infection of others, but the extremity of the thumb will be protected, if there be employed a suitable dressing, consisting of bichloride gauze, outside of which is put rubber tissue, and a bandage about all. The dressing should be repeated daily. It is best to do this in order to observe the progress and evolution of the lesion. The glands will continue to enlarge and indurate, and in due course of time a generalized syphilide may be expected, and then is the time to use general treatment. There is no necessity for giving general treatment before, unless it be with the idea that you may mitigate the secondary lesions which appear, or postpone them to a further date, in which there can be no advantage; and, as there exists no possible danger of infection to any other individual so long as the dressing is kept on, there does not seem to be any reason why general treatment should be pursued until the disease fully generalizes itself, when it should be pushed with vigor. Then quick and marked results will always follow the exhibition of the remedy.

# Gynaecology and Obstetrics.

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## ABDOMINAL HYSTERECTOMY FOR INTRALIGAMENTOUS FIBROID TUMOR; ENUCLEATION; VAGINAL FIXATION OF THE STUMP.

CLINICAL LECTURE DELIVERED AT ST. LUKE'S HOSPITAL, CHICAGO.

BY HENRY T. BYFORD, M.D.,

Professor of Gynæcology, Chicago Post-Graduate Medical School; Professor of Clinical Gynæcology, Woman's Medical College of Chicago; Gynæcologist to St. Luke's Hospital; Surgeon to the Woman's Hospital of Chicago.

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GENTLEMEN,—Some points about the case we have to-day are obscure, and it will be necessary to make an examination to determine just what the trouble is, and what we shall do. At two office examinations I diagnosticated uterine fibroid developed in the pelvic connective tissue. To-day the mass felt very much like a subperitoneal hæmatoma. The history is indefinite. We have no history of extra-uterine pregnancy, nor of an acute attack to cause hæmatoma, although there has been a suppressed menstruation. Nor has there been that interference with the action of the bowels which often accompanies the latter, particularly in the beginning. Lately her trouble has been increasing, and she has experienced much local distress, general weakness, and loss of appetite. There is no menorrhagia. The tumor fills the pelvis almost as if moulded in it, and extends above the pubes. The question is, Shall we make an abdominal section or shall we puncture through the vagina? If we make an abdominal section and find a hæmatoma, we can clean it out very thoroughly and possibly stitch the edges of the capsule to the abdominal wall. If we make an incision or puncture through the vagina and find a fibroid, we may thus complicate our subsequent abdominal section. On the other hand, if we find a hæmatoma, we can scoop out the blood-clots and drain from below without entering the peritoneal cavity.

The patient is now thoroughly relaxed by the ether, and we shall make our final examination. She is a married woman, Nora M., forty-



four years old, and has never been pregnant. On inspection the abdomen appears somewhat full. A fibroid of this size nearly always causes the greatest prominence over the symphysis, at or near the median line. This tumor evidently does not do that. There is an indefinite feeling of hardness in the median line, but there is slight resonance over the pubes, and I can feel, while pressing, something slip like intestines. These are not the usual characteristics of a fibroid. In most fibroids there is a definite area of dulness. Yet it is possible for a fibroid to be developed posteriorly and have intestinal adhesions anteriorly, and thus simulate a hæmatoma, but such adhesions are rare.

Now we shall have the feet elevated and make a bimanual examination. As I push my finger into the vagina it comes upon a tumor about an inch behind the subpubic ligament; it is a soft solid tumor with an indefinite feeling of elasticity. Pressing up behind the pubes, I find the cervix high up in front. Bimanually I feel the uterus passing up on the anterior surface of this tumor. It is intimately connected and moves slightly with it.

At a previous digital examination of the rectum the tumor seemed to extend below the level of the viscus. It felt as if it had developed in the connective tissue and become somewhat attached to the rectum, and, as it developed in all directions, that part of the bowel attached was raised up on the side of the burrowing tumor. At the same time the calibre of the rectum was not interfered with, as would be likely from so large a hæmatoma. The tumor is quite definite in shape above, and is reported by her physician, who is my colleague, Dr. Frank Cary, to be growing.

This case illustrates the fact that at different examinations a tumor may feel entirely different, and that the signs and symptoms of various tumors or enlargements may be mixed and render a positive diagnosis impossible. This mass feels like a hæmatoma and occupies the favorite position of one, but lacks the history and some of the physical signs. It occupies a very unusual position for a uterine fibroid and possesses few of the physical signs. In such cases it is always better to examine the patient a second time, and, if practicable, under the influence of ether. As the original diagnosis of fibroid made by Dr. Cary and myself would seem not unlikely to be correct, we shall make an exploratory abdominal incision and be prepared for a hysterectomy.

In performing an operation the first thing to do is to place your instruments where you can reach them yourself. Being ready I take out a few forceps, my knife and probe-pointed scissors, and put them on the towel covering the pubes where they will be handy. I shall not

make this incision very low down, because the bladder is, of course, pulled up with the uterus. I put the point of the knife on the median line and make a deliberate incision downward from a little below the umbilicus towards the pubes, cutting through the fat with one or two strokes. I am now down to the fascia, and we have here quite a little welling of blood from vessels near the bottom. By using cold water we can stop this bleeding, and thus escape the annoyance attending the use of many hæmostatic forceps. I shall now make a little nick in the fascia to see whether I am in the median line. I find by probing that I am in the sheath of the right rectus muscle near the edge. Having located the edge of the muscle with the probe-point of the scissors, I rapidly slit up the fascia with them, and force the muscular edges apart with the knife-handle. Now I take up some of the subperitoneal connective tissue with forceps, and partly cut and partly tear it asunder until we arrive at the denser peritoneal membrane.

Right here I will illustrate another point in diagnosis. Not having cut through the peritoneum, I can palpate this tumor quite freely. I could stop here or go ahead. If I found a hæmatoma I could stop. But, as it gives to the fingers the impression of a fibroid, I shall go ahead. In attempts at palpation through the peritoneal membrane, care must be taken, however, not to separate it extensively from its parietal connections, as subsequent suppuration would probably result.

Lifting up the peritoneum with forceps and cutting through it, I find that the underlying omentum does not sink away from it upon the entrance of air, but clings to it, and is therefore adherent. This accounts for the sensation of something slipping which confused our diagnosis, and rendered the tumor more difficult of palpation than fibroids ordinarily are. Gently separating the delicate structure from the parietes, we at last get a glimpse of the corpus uteri projecting up out of a soft fibroid mass, like a king on a throne. I confess that even a king sits easier on his throne than does the surgeon stand before this mitred mass. Housed under overarching broad ligaments and filling the pelvis, there is nothing to do with it but to tear the mass from its stronghold, trusting that the patient's already exhausted strength will endure the trial. The broad ligaments are flattened over it so that they cannot be ligatured beforehand, and more or less hemorrhage may be expected to occur.

Before making this desperate attack, however, we must take our precautions. As the patient is very fat, we clean away all fatty *débris* from the parietal edges, to keep it out of the abdominal cavity. We



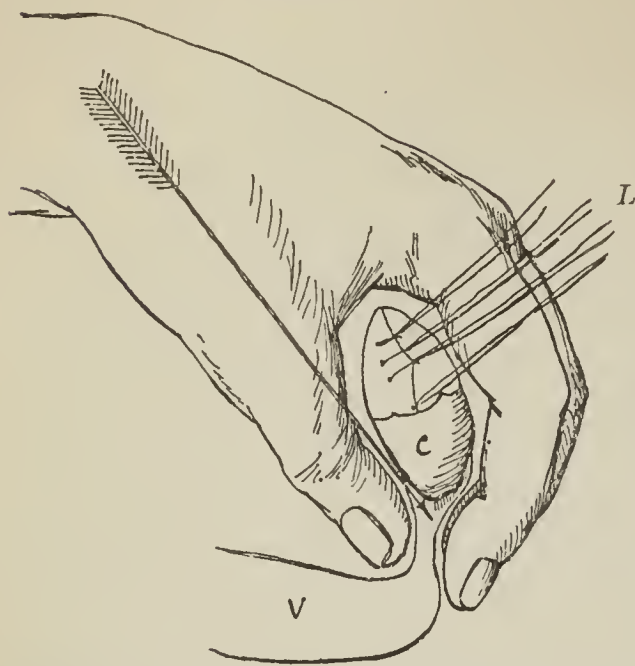
also protect the intestines—for they are our most easily damaged structures—from irritation, by covering them with a large flat sponge, clamped to the peritoneal edges by forceps.

I want now to cut the capsule and enucleate, but this capsule does not separate posteriorly, and the pelvis is so evenly full of tumor that I cannot get at it advantageously. Even though Dr. Watkins is pulling up the fundus with vulsellum forceps, I cannot raise the mass in the least. I therefore rather blindly gouge down behind it with my fingers, tearing through the peritoneum at the posterior reflection, and lift the mass up. One connective-tissue strand may be easily torn, but when thousands of them are interwoven it requires almost stronger fingers than mine. It tires them out and makes them ache. I may truly be said to be making my living by the sweat of my brow. Gradually, however, I get it up from its bed, and now, by the practice of as much delicacy of touch as I have just exhibited of vigor, I hope to be able to successfully ligature the upper parts of the torn broad ligaments at the sides of the pelvis,—still almost inaccessible with the tumor thus in the way.

Having accomplished this, and cut the threads near the knots, I clamp the broad ligaments against the tumor by forceps as best I can. I now make a superficial incision through the peritoneum transversely across the anterior surface of the uterus, about an inch above the attachment of the bladder, and separate the peritoneum and bladder from the uterus down to the vagina. Now I put my rubber tubing around the cervix under the mass, tie it, transfix it with pedicle-pins, and amputate a little above the latter. I cut a transverse wedge-shaped piece out of the stump so as to lessen its size, ligature it in three parts just above the rubber tubing, and sew up the edges with four or five interrupted coarse sutures, leaving all ends about six inches long. I cut the tubing off, and, as there is no bleeding, take out the pins and hold the blanched stump up by the long ends of the sutures. The stump being thus prepared, I take it in my left hand, with my thumb against the anterior wall reaching clear down to the vagina, and my first two fingers behind it in the recto-uterine cul-de-sac. By pushing down and separating the bladder from the vagina for about half an inch from the cervix, I can make my thumb and fingers meet under the external os uteri with only the vaginal walls intervening. (See Fig. 1.) With a slender pair of hæmostatic forceps I punch down between my thumb and the cervix until the forceps-point enters the vagina, where it is felt by Dr. Gaven. By spreading the blades, I can draw up the anterior vaginal wall, and take hold of it about the puncture with other forceps.

By scissor-snips I enlarge the opening laterally and anteriorly, and ligature a spurting arteriole with strong catgut. Now I pass the small forceps holding the stump sutures down through the vaginal opening

FIG. 1.



METHOD OF HOLDING STUMP WHEN PUNCTURING THE ANTERIOR VAGINAL WALL WITH SLENDER FORCEPS.—V, vagina; C, cervix; L, ligatures. The arrow represents the direction of introduction of the forceps.

just made, and, while Dr. Gaven pulls them down into the vagina, I assist by my thumb and fingers in anteverting the stump. It slides into place in the vagina like a foot in a boot, and the peritoneal cavity is rid of it.

While Dr. Watkins holds back the intestine, I take this long catgut thread, pierce the peritoneum coming from the bladder at the left side, and attach it to the peritoneum posteriorly so that it draws the serous membrane together at the edge of the left broad ligament stump. Two or three more punctures of the needle, with care not to pierce too deeply, bring me with

my continuous suture to the right broad ligament stump. Now the uterine pedicle is entirely shut off from the peritoneal cavity, and can do no harm. There is a little bloody oozing in the pelvis, owing to the extensive enucleation, but it is much less than there would have been had we not sewed up the peritoneal edges. Those of you who can see well, however, have noticed that I was unable, as in most cases, to place the catgut continuous suture so as to cover all of the raw surface. Hence, in closing up, I shall leave this glass drainage-tube, which I put in so as to reach to the bottom of the pelvis. In about thirty-six hours, when the bloody oozing will have become serous in character, I shall remove it.

Now there is little doubt that this patient will get well. You may ask me why I feel so confident of her recovery, since this is one of the roughest and most difficult intraperitoneal operations imaginable. I answer, simply because there is nothing left in the cavity to kill her. It is not what you take out, but what you leave, that kills the patient, as Dr. Parkes used to say. There are no bruised viscera left, only a narrow catgut suture a trifle over an inch long with a tiny broad ligament stump at each end, and a little raw connective tissue, all at the bottom of the pelvis.

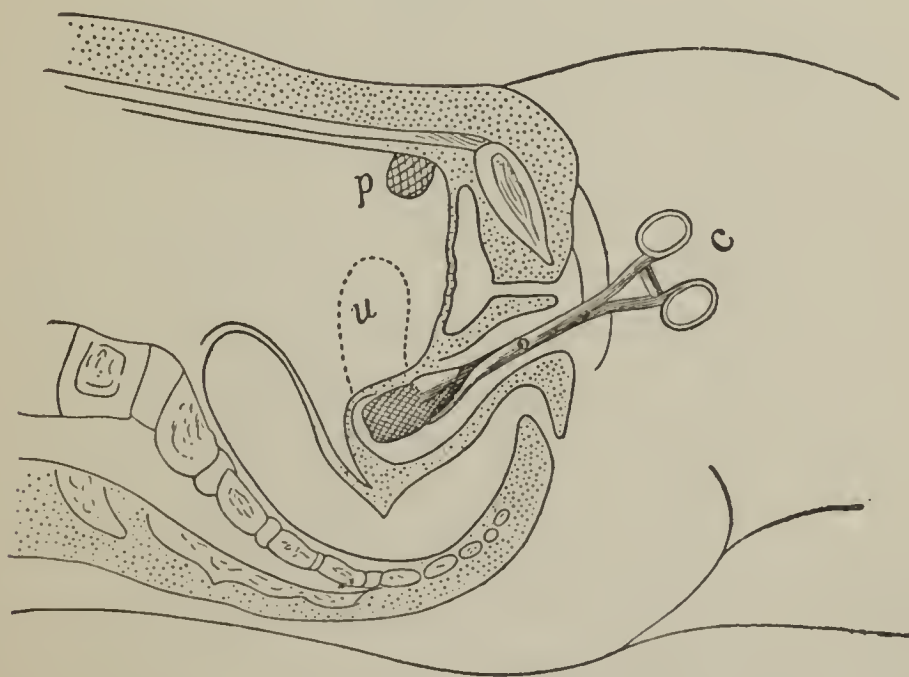


The external stiches being in, and the rim of the drainage-tube protected by a rubber dam, we have now but to draw the patient to the end of the table, put her in the lithotomy position, introduce our vaginal retractors, and slip this clamp (Fig. 2), as you see, along the stump sutures, over the anteverted stump, and clamp it. It reaches just beyond the ligatures, so as to include them. The stump will slough off at this point, and the slough be inclosed in its blades and kept from contact with the living tissues. (See Fig. 3.) After the separation of the slough, which will occur in two weeks, the remain-

FIG. 2.



FIG. 3.



*c*, clamp forceps applied; *p*, position of stump in ventral fixation; *u*, normal position of uterus.

ing cervix will right itself and the granulating tissue contract, so that in a short time the portio vaginalis will present a normal feel to the examining finger.

[*Later Note.*—The patient made a good recovery.]

# OVARIAN TUMOR—DIAGNOSIS AND OPERATION.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

BY MATTHEW D. MANN, M.D.,

Professor of Obstetrics and Gynæcology, Medical Department of the University of Buffalo; Gynæcologist to the Buffalo General Hospital.

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GENTLEMEN,—The patient whom I present to you this morning was for a short time an inmate of this hospital last summer. She remained here but a few days at that time, and nothing was done for her. She has lately returned to see if we can do anything for her relief.

Before entering upon the examination of the case I shall briefly relate her history. She is thirty-five years old, and has been married fifteen years. She has had four children, the youngest being now seven years old. She tells us that she has been sick for two and a half years, and that before that time she had had good health. The first thing she noticed was a general enlargement of the abdomen, recognizing it only as her clothes became too tight. Her physician at first thought her pregnant, although she menstruated regularly. Later a tumor was diagnosticated, whose growth has been intermittent. During the last two months the growth of the tumor has been rapid and has begun to cause her pain and inconvenience. When she entered the hospital she was much oppressed for breath and unable to lie down. For two months she has suffered from disturbance of the stomach. This is generally the history of but one kind of tumor. We do not usually get such a history with uterine fibroids, for instance, nor with cysts of the broad ligament; but with ovarian cysts such a history is common. We have obtained, then, from the history a point for our diagnosis. Now, although she gives an almost typical history of an ovarian cyst, you must remember that we cannot diagnosticate pelvic disorders from the history alone. For aught we know, the tumor may be a uterine fibroid, although, as I have already said, this is not likely, since this tumor has reached such an enormous size within two years and a half. Our patient has had children, whereas fibroids are most common in the un-



married or sterile. All these are points against its being anything but an ovarian cyst. The menstrual periods have been regular and profuse until two months ago, when they ceased. The cessation of menstruation is not a characteristic of fibroids, excessive flowing being a commoner but by no means an invariable symptom. In many cases of fibroid tumors women hardly recover from one menstrual period before the next one begins. This point in the history, therefore, throws little light upon the diagnosis.

In order, then, to make a diagnosis we must proceed to a physical examination. From simple inspection we notice the quite characteristic *facies ovariana*. I remember once meeting a woman in the street and diagnosing an ovarian tumor from her face alone. Later on I was informed by her physician that my diagnosis was correct. This woman does not present a very marked *facies ovariana*. She has lost flesh, particularly in the upper portions of her body. This is quite characteristic of ovarian disease. On the other hand, women with fibroids are often exceedingly fat, gaining rather than losing flesh.

This patient's abdomen is enormously distended. Supposing this tumor to be ovarian, I should say that its weight would be between sixty and seventy pounds. On palpation I find that the walls are tense, yet give to the hand a sense of containing fluid. I cannot describe this sensation; it can be gained only by experience. Now, if this be fluid, how can we tell whether we have to do with a case of ascites or a cyst? There are two points which will enable us to decide this. One is the *shape* of the enlargement. As our patient lies upon her back the abdomen retains its conical shape, not flattening, as would be the case were the fluid ascitic, nor does the shape alter when she turns upon her side. The other point is the result of percussion. If the swelling were due to free fluid in the abdominal cavity, however great the distention, there would be tympanitic resonance over the upper portion, the patient lying on her back. In this case there is flatness over the summit of the tumor. Moreover, this tension of the abdominal walls is much greater than that produced by abdominal dropsy. Notice that the percussion-note is flat all over the tumor. If this is a neoplasm it must have pressed the small intestines away. It cannot press the large intestine away from the side, but it crowds it down into the flanks. Therefore in these cases we usually find tympanitic resonance low down on the sides, where ascitic fluid would naturally gravitate. Sometimes the resonance will be found in both flanks, but usually it is present on one side only. In this case we find tympany in the flank. Again, in ovarian tumors we can trace the tympanitic resonance all around the

tumor, forming what Tait calls the "tympanitic corona." This tumor is so very large that the intestines are crowded up against the liver, causing a break in the tympanitic corona. Otherwise the resonance is well marked. Percussion then assures us that we probably have not to do with a case of ascites.

Notice that this tumor is very irregular. Here in the flanks, for example, and at points lower down I can feel hard masses, although the abdominal wall is quite œdematous, and the sense of touch thereby obscured. These hard masses are characteristic of daughter-cysts on the wall of the parent-cyst, the whole making up a large multilocular ovarian cyst. No one can say positively that this tumor is an ovarian cyst, but from the history, physical examination, and general appearance of the woman, we may say that the chances are very strongly in favor of such a diagnosis.

When the woman entered the hospital, a few days ago, she was in no condition for operation. In order to give her immediate relief I tapped her and withdrew twenty-three pounds of fluid. This made a slight reduction in the size of the tumor, allowing her to lie down and to eat with more comfort. As a rule, I do not believe in tapping ovarian tumors. I never tap small tumors, but in a tumor of this size tapping performed a short time before operation gives the patient an opportunity to recuperate. There is always danger of setting up septic trouble by tapping, and one should never aspirate unless he is prepared to operate within twenty-four hours. I intend to operate upon this woman to-morrow, and, in order to get her into the best possible condition for taking the anæsthetic, I shall tap her again this morning.

I introduce a small trocar at a point situated four inches obliquely upward and to the right from the umbilicus, and withdraw some fluid by means of Allen's surgical pump. The fluid is quite characteristic of ovarian cyst. Such fluid may vary greatly, from being bloody and grumous to being light and clear as water. In this case it is thick and stringy, almost like white of egg. It undoubtedly contains considerable albumen. We have obtained different colored fluids at each of the previous tapplings.

You see a depression has formed right in the centre of the sac, the pump having sucked out the contents of one of the loculi. This will undoubtedly fill up again, as the same thing occurred at a previous tapping. A small amount of ascites can now be demonstrated in the epigastric and left hypochondriac regions. I shall now introduce the aspirator in another spot. We have now obtained about two quarts of



fluid. Even this amount softens the tumor and allows the patient to breathe more easily. I am afraid lest further tapping might start up hemorrhage and do more harm than good. You can see from this the utter futility of attempting to empty a multilocular cyst by aspiration. By tapping I do not expect to do any more than relieve her of some of the symptoms due to pressure from the tumor.

In operating for the removal of the cyst I shall probably be obliged to put my hand into the tumor and break up the partitions between the cysts. I shall then be able to remove the growth through a large abdominal incision. There probably will be adhesions, but not very serious ones. Before the operation I shall make a vaginal examination to determine the relation of the tumor to the uterus. When the uterus is in front of the tumor and high up, the cyst is usually intraligamentous. This is one of the worst possible conditions for operation, as there are then invariably large, firm adhesions, and no true pedicle.

[*Later Note.*—A median incision about nine inches in length was made. Before opening the peritoneum all hemorrhage was checked. The tumor was found to be adherent in many places, especially to the parietal peritoneum anteriorly and to the right. After emptying some of the loculi through the trocar and breaking up partitions, the tumor was removed. The pedicle was secured by a Tait knot of No. 7 catgut, and dropped into the abdominal cavity. There was very little bleeding, although a few fine catgut sutures were introduced in order to close bleeding vessels in the torn adhesions. About a pint of ascitic fluid, coagulated during the operation, was found. The uterus being pressed far backward, and the round ligaments much stretched, the latter were sewed together with silk in front of the uterus in order to retain that organ in place. Nine silver sutures were introduced. Previous to the twisting of these sutures, the peritoneum and fascia transversalis were united by catgut sutures.

The tumor was a multilocular ovarian cyst. The cyst and its contents weighed sixty-seven pounds.

The patient left the hospital at the end of three weeks, perfectly well, and with the uterus in its normal position.]

## REMOVAL OF THE UTERINE APPENDAGES.

CLINICAL LECTURE DELIVERED AT ST. BARTHOLOMEW'S HOSPITAL.

BY F. H. CHAMPNEYS, M.A., M.D., F.R.C.P.,  
Obstetric Physician to St. Bartholomew's Hospital, etc.

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GENTLEMEN,—The question for our consideration to-day is the removal of the uterine appendages,—a question which may be described as burning, as all of you who read the medical journals must be aware. The time is not yet come when we can pronounce a final judgment on its indications and its justification; still, there are certain principles to guide us in practice, and it will not be unprofitable for us to review the situation by their light.

Removal of the uterine appendages is an operation commonly practised on certain animals,—pigs, for instance. Some of you may have witnessed the spaying of a sow, with the object of fattening,—a common operation. Again, we are told that, in parts of America, cows are spayed on a large scale, for the purpose of maintaining prolonged milk-production.

In women it has been practised to check the growth and bleeding of fibroids, to remove diseased appendages, for the cure of neuroses, for the cure of dysmenorrhœa, and for the purpose of sterilization.

### REMOVAL IN ANIMALS.

It is probable that the practice of spaying female domestic animals goes far back in the history of mankind. We know that the castration of male animals is a very ancient practice; and it probably formerly seemed less of a step to proceed to the spaying of female animals than it does now, for the ovaries were considered the female testicles, and were called “testes muliebres.” We know by means of the microscope what our ancestors could not know without it,—namely, the differences between the ovary and the testicle.

The purpose of removing the ovaries in domestic animals has been generally to promote fattening, on the principle which has been described by natural philosophers under the title of the “antagonism be-



tween growth and genesis.” Among the examples of this principle may be named : (a) The delay of reproduction till nearly full growth—exemplified in animals and plants in many ways, among others by the situation of the flower at the termination of a growing point, and its constitution by the suppression of internodes. (b) The artificial hastening of reproduction by arresting growth in plants—the gardener, wishing to hasten the flower or fruit, cuts the roots, stops the growth, and a small tree may become laden with flowers or fruit. (c) The loss of fertility by excess of growth—a female animal which grows very fat is liable to become sterile, and a plant which grows very fast is apt to flower little. Look at a shrubbery of rhododendrons : those which are full of flowers have made but little growth this year ; those which have made much new wood have few flowers.

The spaying of a sow is a simple operation. The animal is thrown ; the man kneels on its neck, feels for the iliac crest, and just in front of it makes a hole with his pocket-knife large enough to admit two fingers. With these he feels for the “pride” (that is, the fimbriated extremity of the Fallopian tube) ; pulls it out ; pulls out the uterine horn, the corpus uteri, and the other horn in order ; cuts off the corpus uteri ; drops the stump back again ; and puts a stitch in the skin. The animal jumps up as soon as he removes his knee, and, never knowing what it is not to feel hungry, goes off to feed. If the sow has farrowed, it is found advisable to put a ligature round the stump of the uterus, as the parts remain permanently more vascular.

Wholesale spaying of cows during lactation has been described as being practised in Texas, for the purpose of prolonging lactation, with a mortality of about five in a thousand (about the same as the mortality in a good lying-in hospital). One cow thus treated had already, in 1884, been in full milking order for eleven years, and, for all I know, she may be cheerfully continuing her lactiferous functions up to the present time. If this is genuine, the *rationale* would be that the tide of activity is prevented from being transferred from the mammary to the reproductive glands, as naturally happens, and that a temporary condition thus becomes fixed and permanent.<sup>1</sup>

#### REMOVAL IN WOMEN.

1. BATTEY'S OPERATION consists in the removal of the ovaries, not on account of disease in them,—they may be perfectly healthy,—but in order to act on other parts by the production of an artificial

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<sup>1</sup> Boston Medical Journal, October 4, 1884, p. 352, and following number.

menopause. The operation has been known also as "normal ovariectomy," "oöphorectomy," and "Hegar's operation." Both Battey and Hegar practised it in the same year, 1872, but Battey published his cases, while Hegar did not do so for some time. It had long before been proposed by Dr. Blundell, of Guy's Hospital (in 1823), but had not been carried out. Dr. Blundell was the author of many highly pregnant suggestions which have been carried out since his time.

The main object of the operation of Battey was to produce an artificial menopause, and its indications were intended to include the cure of bleeding fibroids, the cure of dysmenorrhœa, the cure of neuroses, and the relief of pain caused by prolapsed, fixed, and tender ovaries.

(a) *As Regards Bleeding Fibroids.*—It has been found that the operation is not suited for cases in which the tumor exceeds a certain size. If it be very large, it is generally impossible or very dangerous. The tumor, in growing, expands the layers of the broad ligament, and either envelops one or both ovaries, or grows so closely to them as to deprive them of a pedicle. It may thus be impossible to find the ovaries at all, either during or after the operation of hysterectomy; or, if they are seen, the pedicle may be so short (if present at all) that it is impossible to avoid wounding the large vessels in the neighborhood. If these are wounded, so pliable is the tissue of the uterine platysma that it is often impossible to stop the bleeding without removing the whole uterus. It has been found in practice that if the tumor reaches above the navel it is generally not a suitable case for removal of the ovaries. I will not go further into the question of operation, for we are concerned not so much with the mode of operating as with the indications for operating.

It must be noted that the operation is unsuitable for cystic fibroids, which do not seem to be affected by it. When one or both uterine appendages are removed, it almost invariably happens that within the next day or two there is a discharge of blood from the uterus,—metrostaxis, as it is called; and some operators prefer on this account to operate just before the monthly period, so as to have only one bleeding instead of two.

Among the phenomena of the artificial menopause may be included the various troubles, especially neurotic, which are usual after the natural menopause. Among these may be mentioned the flushing and sensation of heat and cold, which I have heard described as "the hot heats and the cold heats," hysteria, hypochondriasis, mania, and melancholia. Another phenomenon that may be mentioned is the



growth of hair on the face, as sometimes happens after the normal menopause.

The result of the operation is usually to stop menstruation, either at once or shortly. Sometimes, however, it continues for some time, or even permanently, and, indeed, the woman may become pregnant. In such cases there arises the question as what it is which has been removed,—a question not always easily answered, even in the presence of the specimen. Still more difficult is it to say whether any part has escaped removal. In cases of persistent menstruation, and still more in cases of pregnancy, imperfect removal is less unlikely than the existence of a supernumerary ovary or isolated portions of ovarian tissue, though these are not unknown.

(b) *As Regards Dysmenorrhœa*.—The operation has been considered to be indicated in cases of great pain at the monthly periods, especially when accompanied by nervous manifestations. We shall have to refer to this later on, for that form of dysmenorrhœa described as spasmodic is essentially a neurosis, and will be more fully discussed with other troubles of the same class. The idea of removing the ovaries is that with their removal there will be an end of the suffering which returns every month and with which they are credited.

(c) *For Neuroses*.—It has been recommended for the cure of epilepsy, hystero-epilepsy, convulsions, and threatened insanity, especially when the uterus is absent while the ovaries are present.

You may take it that every year the operation is falling more and more into disfavor for these purposes.

(d) *For Prolapsed and Fixed Ovaries*.—The indication here is simple. Prolapsed, fixed, and tender ovaries may cause pain in walking and sitting, as also in defecation and in coition.

2. FOR STERILIZATION, ESPECIALLY AFTER CÆSAREAN SECTION.—When a woman has had to undergo Cæsarean section on account of some deformity in the pelvis, it is obvious that if she cannot bear one child naturally she will not be better able to do so on subsequent occasions, and so it has been advised to sterilize her. This is especially the case when the disease causing pelvic deformity is osteomalacia, a disease which advances rapidly during pregnancy, remaining in abeyance during the intervals.

For the purposes of sterilization it has been recommended to choose Porro's operation rather than Cæsarean section. But sterilization can be accomplished more simply than by removing the uterus, tubes, and ovaries. Removal of the ovaries is sufficient ; but even less than this is enough. A short time ago I sterilized a woman during Cæsarean sec-

tion by tightly ligaturing the tubes. I did not know at the time that Dr. Lungren had already done this in America some time previously,<sup>1</sup> and neither of us was apparently aware that this method had been recommended by the prolific Dr. Blundell, together with excision of part of the tube, a method which I adopted in another case. My patient menstruated normally after the operation, Dr. Lungren's only twice. By this method the woman though sterilized preserves her ovaries. It has been thought by some that the occlusion of the tubes might give rise to trouble, but this has not been the case.

3. REMOVAL OF THE UTERINE APPENDAGES FOR DISEASE OF THE APPENDAGES, AND ESPECIALLY OF THE TUBES.—This has been called "Tait's operation." Tait's early cases were cases of very long-standing disease, women who had suffered ever since their marriage from intense dysmenorrhœa, dyspareunia, frequent attacks of perimetritis, and even general peritonitis. Now, no doubt in certain cases of this sort, bearing well in mind the definition which I have quoted,—disease of long standing, perpetual misery, with occasional attacks of dangerous illness,—the operation is justifiable, and the results are often highly satisfactory.

What are the principal causes of diseases of the tubes? The causes are many, but the two great causes are puerperal affections and gonorrhœa. Among rarer causes may be mentioned cancer and tubercle.

(a) *Puerperal endometritis*, beginning as an acute disease, and seen in a woman who has died of blood-poisoning after delivery, is a well-marked affection. When she does not die, the disease may spread up the tubes, it may become localized in them, the fimbriated extremities may become occluded, then the tubes may become distended with fluid of a more or less irritating nature, and there may be leakage of this from time to time into the peritoneal cavity, giving rise to recurrent attacks of perimetritis or peritonitis.

(b) The other great cause is *gonorrhœa*. The course is the same: it spreads up the tubes, the fimbriated extremities become occluded, and there may be a discharge of matter into the peritoneum, or more rarely through the uterine end. When a woman gets perimetritis soon after marriage without conception, the chances are greatly in favor of her having been infected with gonorrhœa. This may have happened quite innocently so far as the husband is concerned. The attack of gonorrhœa in the husband may be a matter of ancient history, and there may have been no sign, not even a little moisture at the meatus, to

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<sup>1</sup> American Journal of Obstetrics, 1881, vol. xiv. p. 83.



suggest the existence of a possibility of infection; yet there it is. We do not know how long gonorrhœa may work in the male urethra. I have known it to infect one tube and apparently lead to extra-uterine pregnancy subsequently in the other.

The tube may be distended by watery fluid, blood, or pus. Of these the last (constituting pyosalpinx) is the most important, but we do not know how often it occurs. There are, however, some statistics which are quoted again and again, as if they settled this point, namely, those of Dr. Kingston Fowler, of the Middlesex Hospital.

These statistics were brought forward before the medical society in 1885, and gave the results of the post-mortem examinations at that hospital during a period of three years. He found in all fifteen cases in which the tubes were diseased, and in eight of these he considered that death was due to the condition of the tubes. Now, if we examine these cases a little more closely we shall find that, of these eight cases in which death was thought to have been caused by the condition of the tubes, three were cases of cancer (an important thing to bear in mind), and one had a large fibroid. Of the fifteen cases no less than five were cases of cancer. You are probably aware that at the Middlesex Hospital there is a large cancer institution, and that fact has to be remembered in interpreting the results of the post-mortem examinations at that hospital. We do not know what was the total number of post-mortem examinations of women during the three years which furnished these fifteen cases, nor the proportion of cancer cases among them; but that five out of the fifteen cases of tubal disease were cases of pelvic cancer is a fact of great importance. If we should be reluctant to calculate the average mortality from cancer out of these statistics, we ought probably to exercise a similar caution in calculating the frequency or danger of tubal diseases from them.

Besides, if the disease of the tubes be the result of cancer, that again detracts from the value of any inference as to the danger of tubal diseases. The woman has already a mortal disease, and it matters little to her whether she has disease of the tubes or not; it would not make her case appreciably worse, and their removal would not make her practically any better.

Dr. Lewers entered into an investigation of the same kind, but in a different way. He took a hundred cases, consecutive or nearly so, in the post-mortem room of the London Hospital, and found in all five cases of pyosalpinx and fourteen hæmatosalpinx, in two of which only the condition of the tubes seemed to contribute to the fatal result. Now, if you look at the ages of these women you will find that many

of them managed to survive to an advanced age, and that their average age at death was about forty-two. This looks as if disease of the tubes might not be so dangerous as has been said.

*The Relation of Tubal Affections to Perimetritis.*—In 1860 to 1862 Bermetz and Goupel proved the great frequency of this connection. Bermetz proved that in cases of perimetritis the tubes were very frequently affected. His observations were quoted, but were not generally accepted; they have been confirmed in later times.

He makes three classes: (1) Puerperal, (2) gonorrhœal, (3) menstrual.

The puerperal and gonorrhœal classes require no further explanation, but the menstrual class is a little puzzling till you look into it more closely. It refers to cases of perimetritis in which menstruation was arrested. His idea was that arrested menstruation produced inflammation, but I am inclined to think that he substituted cause for effect. We know that in inflammations about the uterus you may have either profuse loss of blood or arrest of the menstrual discharge. In taking the history of cases of perimetritis you often find that the periods are reported to have stopped. These were not cases in which the arrest of menstruation caused inflammation, but in which inflammation caused arrest of menstruation.

The relation between perimetritis and gonorrhœa has been discussed by Næggerath,<sup>1</sup> and the frequency of this connection insisted upon.

Another interesting paper dealing with the connection between perimetritis and the affections of the tubes is contributed by Polk, who goes very carefully into the physical signs of perimetritis before operation, into the condition actually found during operation, and the physical signs after operation. This comparative description is very instructive, for it shows that the common physical signs of perimetritis are, at least in a large number of cases, associated with tubal disease. Other operators have shown results somewhat similar, but I know of no observations so careful in this respect as those of Polk.

There is no doubt that the tubes furnish the route, and, in many cases, the focus of perimetritic inflammation.

THE GENERAL QUESTION OF REMOVAL OF THE APPENDAGES.—  
(1) *For Neuroses.*—Experience shows that, in this, as in other cases of neurosis, surgical treatment is unsatisfactory. A neurosis is not usually a local but a general affection, and the place where the pain is felt is not always the seat of disease.

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<sup>1</sup> American Gynæcological Transactions, 1876, vol. i. p. 268.



Thus, in "ovarian neuralgia" it by no means follows that there is anything the matter with the ovaries. Those cases of left submammary pain, so common in women, are not to be benefited by excision of parts of the ribs; nor if a patient suffers from "clavus hystericus" do you cut out the place. Indeed, if you were to go on following the pain from place to place, there would soon be nothing left of the woman to remove.

Take another neurosis, vaginismus,—essential vaginismus, without any discoverable physical cause. In such cases no operation does any good (though they are currently said to be certainly curable by operation), not even the great operation performed by nature when she passes a large child's head through the genital passages. After parturition of a full-sized child these patients are usually as bad as ever.

The treatment of removal of the uterine appendages for neuroses is becoming constantly more discredited.

(2) *For Dysmenorrhœa.*—Those cases of ovaries without a uterus, where there is great menstrual suffering, are said to be typical cases for operation. I would, however, point out that a woman with undeveloped genital organs is often badly made in other respects. She has not been well finished off in mind or body, and you will not finish her off any better by removing her ovaries. She was born a person of unstable equilibrium, and a person of unstable equilibrium she will remain.

The same holds good of ordinary neuralgia of the ovaries. The removal of these organs for neuroses either transfers the neurosis to another part, or does not even do that. If it should, in any case, relieve it, it by no means follows that the pain was in the part removed, or justifies the operation; for we must remember the physical and moral excitement of an operation, and the fact that some of these cases have been relieved by simply cutting through the abdominal walls and doing nothing else. General treatment, on the other hand, often relieves neuroses. Some of the worst cases are those where neuroses are complicated with the morphine habit. For them there is no cure unless the habit is broken; but this often involves severe suffering. Moreover, morphine, like drink, utterly demoralizes, and neither a drunkard nor a morphine-taker can be trusted nor their word believed. These are some of the reasons why good practitioners fight so strongly against beginning a morphine habit.

(3) *For Sterilization.*—I have already spoken of the operation in connection with Cæsarean section. No doubt, in cases of this kind, if removal of the ovaries were the only way of effecting our object we

would not hesitate. It is vastly preferable to the repeated destruction of children, or to repeated Cæsarean section, and far less dangerous than the latter,—I mean repeated Cæsarean section ; but I am not at all sure that the percentage of recoveries (if all cases were reported) is much greater in removal of the appendages.

(4) *For Bleeding Fibroids*.—The typical case in which the removal of the appendages is indicated is that of a young woman, with a soft, rapidly-growing fibroid, associated with profuse hemorrhage. I say a young woman, because she has a large portion of her fertile life before her, during which the fibroid may continue to grow, and she may continue to bleed, until the supervention of the menopause. I may remark that the advent of the menopause is often much delayed by the existence of a fibroid, even much after the age of forty-five or even fifty ; particularly by a soft fibroid, because it is not only more vascular, but is more capable of growth.

But while it is more rapid in growth, it is also more amenable to treatment. Hard fibroids do not grow so quickly, but they do not shrink so quickly either.

If you allow the fibroid to grow too much, it passes the limit of size when removal of the appendages is feasible, and then the only certain remedy is hysterectomy.

By removal of the appendages the bleeding is generally arrested, but not always immediately, and sometimes not at all. These are the cases in which it is not always possible to be sure that all the ovarian tissue is removed. Ovaries, when removed in such cases, often look abnormally hyperæmic and succulent, in accordance with their abnormal activity. Fibrocystic tumors are not amenable to treatment by this operation.



**ABDOMINAL SECTION PERFORMED FOR THE  
THIRD TIME ON THE SAME PATIENT  
FOR THE RELIEF OF PERSISTENT  
PAIN AND METRORRHAGIA.**

CLINICAL LECTURE DELIVERED AT THE NEW YORK CANCER HOSPITAL.

**BY HENRY C. COE, M.D., M.R.C.S.,**

Professor of Gynæcology in the New York Polyclinic; Gynæcologist to the New York Cancer Hospital; Assistant Surgeon to the Woman's Hospital, etc.

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THE patient upon whom I shall operate this afternoon has had such a peculiar history that I thought you would be interested in hearing it. It is briefly as follows :

Miss ———, aged twenty-two, single. Menstruation began at twelve, and was always regular until after the first operation, in December, 1888. She was in excellent health until the summer of 1887, when she took a sea-bath during her menstrual period, and in diving struck her abdomen against a rock, since which time she has suffered with more or less constant pains in the hypogastrium. In December, 1888, Professor W. M. Polk removed her left tube and ovary for pyosalpinx and chronic oöphoritis, the right adnexa being spared, as they appeared to be perfectly healthy. Menstruation was regular after the operation, the flow not being excessive; but she soon began to have dysmenorrhœa, with constant pain in the right inguinal region, especially during defecation.

She came under my observation a year later, when I found her abdomen quite sensitive, with a history of irregular colicky pains such as I am accustomed to refer to the presence of intestinal adhesions following cœliotomy. On making a vaginal examination I readily detected an obscure mass to the right of the uterus, which was extremely sensitive on pressure; there was also great sensitiveness on the right side.

As no relief was afforded by palliative treatment, I performed abdominal section in January, 1890, making my primary incision a little to one side of the old wound, in order to avoid a possible adherent intes-

tine. It was fortunate that I did so, as the gut was firmly adherent along the line of the former incision, so that it was separated with difficulty. There were numerous firm intra-pelvic adhesions, especially on the right side. The mass on the right proved to be a pyosalpinx and small ovarian cyst, which were removed in the usual manner. Adhesions between the coils of intestines were separated, the cavity was irrigated, and a drainage-tube was introduced. There was no rise of temperature after the operation, the bowels moving spontaneously within twenty-four hours. The patient sat up on the fourteenth day, and was soon walking about the ward, to all intents perfectly cured.

Strange to say, I operated upon a similar case the same day, the patient's tubes and ovaries having been removed a year before by the late Dr. Hunter,—a perfectly simple operation, with a normal convalescence. She had never since the operation been free from pain in the left side, and colicky pains in the abdomen. I found a single coil of small intestine firmly adherent to the left stump, which was separated with difficulty. She made a good recovery, and has since married, being quite well.

The point which I wish to emphasize in this connection is, that the simplest and apparently perfectly aseptic case of salpingo-oöphorectomy, with an entirely afebrile convalescence, may have such sequelæ,—omental and intestinal adhesions, giving rise to persistent pain,—and that with our present light we have no sure means of preventing these. This is a subject in which I have taken a peculiar interest, and to which, you will remember, I have frequently referred, laying particular stress upon the fact that the trouble caused by adhesions is often entirely out of proportion to their extent and firmness. Moreover, small indurations in the broad ligaments, which are insignificant from a pathological stand-point, may give rise to serious visceral troubles. I remember a case in which such a nodule, not larger than a pea, situated near the base of the broad ligament, compressed the ureter, causing fatal pyelonephritis; and I have seen the most intense pain produced by fixation of a single loop of intestine on the edge of the omentum. On the other hand, you saw me operate upon a patient three days ago for the removal of an old ruptured ectopic gestation, where the sac was literally embedded in coils of intestine, so that it was almost impossible to dig it out; yet the patient's bowels moved regularly, and she had comparatively little pain. We cannot explain why there should be so much colicky pain in the one case and so little in the other. I suppose that it is due to impeding of the normal peristaltic movements of the gut, as a very slight adhesion is enough to accomplish this.



To return to our patient. She was kept under careful observation in the hospital for two months, and complained of fugitive pains in the right side of the abdomen, not so severe as those with which she had formerly suffered. At the end of two months she flowed profusely for four days. A careful vaginal examination just before she was discharged revealed the presence of an obscure induration at the right horn of the uterus, which was quite tender on pressure.

I saw her at frequent intervals after she left the hospital, and she always made the same complaint of persistent pain in the right groin, with a return of the old colicky pains in the abdomen. The induration was quite distinct, and appeared to be about as large as a marble, but did not increase in size. She has continued to have metrorrhagia at intervals of from three to six weeks ever since the second operation, a symptom which she never had before. Her bowels have been regular, but the reappearance of the previous pains early led me to suspect that the old adhesions had reformed. I treated her locally without the slightest benefit, until, having arrived at the conclusion that, since the uterus was about three inches deep, the persistent flow might be due to the presence of some intra-uterine growth, possibly malignant, I readmitted her to the hospital, in order to keep her under observation and settle that disputed point. The os was dilated with tupelo tents until I could introduce my finger. No additional information was gained either in this way, or by the use of the curette, which brought away only a few granulations. It was possible to explore the pelvis thoroughly with the patient under ether. The nodule at the upper border of the right broad ligament near the uterus was hard, and apparently fused with that organ. I took it to be a cicatrix in the old stump. At the left cornu there was a similar induration. The uterus was in a normal position of anteflexion, and was movable. Regular applications were made to the endometrium, with the use of hot douches, iodine, glycerin tampons, and electricity,—all without relieving the local pain and tenderness, or having the slightest effect upon the profuse irregular flow, which now recurred at intervals of two weeks and was only kept within bounds by ergot and hydrastis. The patient was able to be up and about, but was seldom free from colicky pains in the abdomen. Finally, I asked Professor Polk to see her, and he confirmed the opinion at which I had long before arrived, that the sensitive nodule at the right cornu was the remains of the tube that had become dilated, and that the irritation produced by this was probably the cause of the persistent uterine congestion and metrostaxis—I cannot properly term it menstruation. He believed that coeliotomy

offered the only prospect of relief, and I have accordingly decided to perform it.

A third section upon the same patient is somewhat unusual, and one must be prepared to meet with certain complications as regards the abdominal incision, adhesions, the securing of primary union, etc. I have already told you what I expect to find—a nodule at the site of the stump on the right side (probably the dilated remnant of the tube) and intra-pelvic intestinal adhesions. You see that a mass of dense cicatricial tissue occupies the site of the old wound. I cut considerably to the right of it and divide each layer carefully, in order not to suddenly incise the peritoneum and possibly an adherent loop of intestine. Some difference of opinion exists as to the necessity for this precaution. I have sometimes made my secondary incision exactly in the track of the first, but I prefer the former plan. I once saw an operator narrowly escape opening the intestine, which was firmly adherent all along the line of the old cicatrix.

I have now entered the cavity, and at once feel for my landmark, the uterus, which is in its normal position and only slightly enlarged. At the upper edge of the right broad ligament, about an inch from the cornu uteri, I feel the nodule which was previously located at that spot. It is about the size of a pea, is hard, like cartilage, is firmly embedded in the peritoneum, but is easily brought up into the wound and tied off in the same way as an ovary. It is not the dilated tube, as I supposed, neither is it the old stump. I do not know what it is; perhaps it contains ovarian stroma, which will account for the pseudo-menstruation. This suspicion is strengthened by finding this yellowish mass which you see in its centre, which looks like a corpus luteum. The pathologist will determine this point later. There are absolutely no adhesions on this side.

Feeling for the left horn of the uterus, I encounter another indurated mass, elongated, about an inch in length, and having the calibre of a lead-pencil. I certainly did not find this at the time of the second operation, and I remember that I made a careful examination then. As I lift this into the wound, it is clearly the stump left after the first operation, and bears every evidence of being the dilated remnant of the tube. This I ligate and excise close to the uterus, previously separating a coil of intestine that is adherent to it. There is so much tension on the broad ligament that I shall ligate again *en masse*, in order to be sure that there shall be no retraction of the tissues.

Both stumps are touched with the thermo-cautery previous to dropping them back. I shall now irrigate with boiled water, sponge out



the cavity, and close the wound. There is no need of a drainage-tube.

Before introducing the sutures I shall see if I can discover any more intestinal adhesions, for I confess that I have not yet found a satisfactory explanation of the severe abdominal pains. On raising the right flap of the wound, I find that there is a loop of small intestine firmly adherent near its edge. This must be separated or I fear that the operation will not accomplish its object. This I proceed to do, working slowly and carefully with my fingers and the handle of a scalpel. There is a distinct band uniting the gut to the abdominal wall, but the line of separation is tolerably distinct, and the adhesion is non-vascular.

A further search shows that there are no more adhesions, and I may proceed to close the wound, with the certainty that I have done my best to discover and relieve the cause of the patient's trouble. I may add that I shall use more than ordinary care to keep her bowels moving frequently after operation; in fact I have begun already, having given her an ounce of Rochelle salts an hour before she came to the etherizing-room. I expect her to have an easy convalescence, as she had on the two previous occasions.

[*Later Note.*—The patient's temperature rarely exceeded 99° F. after the operation. Her bowels moved easily within twenty-four hours, and have been moved regularly since. She has complained of slight pain on the right side, by no means so severe as that which she had before. At the end of a week she was anxious to sit up in bed, and at the beginning of the third week was ready to get up. She was flowing so profusely at the time of the operation that it was necessary to introduce a tampon, but the flow ceased in a few hours and did not reappear for four or five weeks, when it was moderate. There is every reason to think that she will finally be relieved.

The pathologist, Dr. Freeborn, makes the following report concerning the character of the nodules which were removed:

“After careful study of the bits of tissue removed from Miss ———, I cannot find anything that could be called ovarian stroma. All I can find is fibrous tissue with fair-sized blood-vessels, and in one bit a mass of granulation-tissue enclosing a piece of silk.”

Two months after the operation the patient was almost entirely relieved of pelvic pain, but there was evidence that the intestinal adhesions had reformed. She had flowed twice since the operation. No tenderness or induration around the uterus.]

# THE NAUSEA AND VOMITING OF PREGNANCY, WITH SPECIAL REFERENCE TO THEIR MANAGEMENT.

CLINICAL LECTURE DELIVERED AT THE CINCINNATI HOSPITAL.

BY CHAUNCEY D. PALMER, M.D.,

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GENTLEMEN,—Nausea and vomiting are not only the most frequent of all the disturbances of pregnancy, but they so generally occur that there are very few pregnant women who are not affected by them at some time and to some degree. Usually they are so mild that they call for little, if any, medicinal treatment. Ordinarily they rectify themselves by the fourth month of utero-gestation. That they are reflex disorders must be apparent. It will very frequently be observed that when some other reflex disorder of pregnancy is manifest nausea and vomiting do not occur, although in previous pregnancies they were the chief reflex disturbances. Sometimes, though comparatively rarely, they become exceedingly grave disorders, and may terminate fatally. It is stated that Dubois saw twenty fatal cases, though Carl Braun, in his wonderfully large obstetrical experience of one hundred and fifty thousand cases, has never seen a fatal case. Every varying degree of severity may be present, from the most mild to the most severe and intractable, in which there are most marked exhaustion and emaciation, with red, dry tongue, fetid breath, dry, harsh skin, epigastric tenderness, extreme thirst, fever, and constipation,—a group of symptoms followed in time by a total rejection of all foods, solid and fluid.

At first, there is plainly present merely a reflex functional disorder of the stomach, most apt to occur to a severe degree in the highly nervous organization. But this functional disorder, when long continued, is transformed into marked organic structural changes of the gastric mucous membrane, as post-mortem examinations abundantly prove.



None of the various theories which have been advanced to explain the gastric phenomena can be accepted as entirely satisfactory for all cases, though each may hold good for some. For instance, Bennett's theory is very satisfactory at times, both regarding causation and treatment. So, also, is Graily Hewitt's, though utterly untenable in some instances.

Let me here say a few words as to what is understood as Bennett's and Hewitt's theories in regard to the causation of the nausea and vomiting of pregnancy. By Bennett's theory is meant a proposed explanation of the nausea and vomiting by the existence of some structural lesion of the cervix uteri,—very plausible, and sometimes, no doubt, perfectly true. By Hewitt's theory is understood the dependence of these symptoms on some kind of uterine displacement or flexion. Most of the proposed theories are true in certain cases; no one is true invariably and at all times.

A pregnant woman is a very uncertain quantity, as to the time, number, severity, and duration of her nervous reflex symptoms, just as she is proverbially capricious and fanciful as to her dietetic likes and dislikes.

Experience teaches, in point of management, that no fixed rules can be laid down. It is prudent, however, to consider all treatment in the following order: *Hygienic, Dietetic, Medicinal, Gynæcological, and Obstetrical.*

1. *Hygienic.*—Little is to be said concerning this feature of treatment more than to make mention that the hygienic care should be as good and scientific as practicable.

2. *Dietetic.*—Great discretion is called for in the choice of foods in pregnancy. No fixed rules need be laid down, for what is suited to one case is not to another, or to the same woman in all pregnancies. Probably the best rule we can follow is to consult personal tastes and inclinations. Sometimes the food most indigestible for non-pregnant women is craved in pregnancy and becomes digestible. I have frequently prescribed koumys, and have found that it is at times much relished, easily retained, and fairly nutritious. The partaking of a small quantity of food with some palatable wine early each morning on awakening, before arising, controls, in a measure, the stomach irritability. Eating a meal at the house of a friend, with pleasant company and surroundings, is sometimes conducive to the retention of a fair amount of food.

When all foods and nutritious drinks, chosen according to time, quantity, quality, variety, and surroundings, and according to a patient's

whims and a physician's devices, are totally rejected, and the pregnant woman is fast passing into a condition of practical starvation, an organic disease of the gastric mucous membrane having developed, it is the physician's duty to withhold all nourishment from the stomach, and put the diseased organ completely at rest. The importance of the principle of rest, as applied to a fractured or dislocated limb, is not more urgent than is the securing of absolute quiet to this diseased organ. The human body can be sustained for weeks—yes, for months—purely by rectal alimentation, no food except merely the smallest quantity of fluids for drink being ingested by the stomach. Several years since I succeeded in sustaining the life of a lady in pregnancy, from the third to the sixth month of utero-gestation, by rectal alimentation alone. In this instance, as in all cases of this kind, I placed dependence upon enemata of peptonized milk, in alternation with meat extracts, to which from a half-ounce to an ounce of whiskey or brandy was added. This patient went to full term, and was delivered of a healthy child.

The principles of the dietetic management of pregnancy, when nausea and vomiting are serious disturbances, are to humor the stomach, if practicable; if not, to utilize the bowel as a nutrient channel.

3. *Medicinal*.—It may be laid down as a rule in medical practice, that any disease for which many remedies are recommended is a difficult affection to cure. The number of remedies recommended for the cure of the nausea and vomiting of pregnancy is very large. Those which the experience of modern practice has proved to be trustworthy are very few. We must be very cautious not to confound the *post hoc* with the *propter hoc*. Notwithstanding that these gastric symptoms resulting from pregnancy cease spontaneously at times without any apparent cause, it is the most natural inference that this improvement results from the use of any medicament then being administered, although the change for the better was in fact purely the spontaneous result of Nature's efforts. Among the most useful remedies are tincture of nux vomica, oxalate of cerium, tincture of iodine, morphine and atropine in combination and hypodermically administered, cocaine, atropine, and the bromide of sodium. It is impossible to give the specific indications and contraindications for each, for they are not known, if they exist. Faradization of the dorsal spine is recommended, but I have no personal experience to strengthen the recommendation.

Tincture of nux vomica, in from one- to three-drop doses, with water, before food, sometimes answers well, as does the tincture of iodine. Oxalate of cerium, even in large doses, very frequently fails. Morphine with atropine, given subcutaneously, succeeds admirably at



times. Cocaine given by the mouth, or applied to the cervix uteri, is worthy of trial. But the two remedies which I have administered with the greatest satisfaction are atropine and the bromide of sodium. The former is given in aqueous solution, in doses of one-two-hundred-and-fortieth to one-forty-eighth of a grain three times a day, increasing from the minimum dose until the full physiological effect of the drug is noticeable. The bromide of sodium is given in aqueous solution before food, and acts, seemingly, by arresting reflex irritability.

4. *Gynæcological*.—That the nausea and vomiting of pregnancy do depend upon various organic morbid changes of the uterus is abundantly sustained by both theory and practice. What better illustration of this etiological doctrine can there be than the speedy subsidence of all gastric disturbances after the improvement and correction of all local uterine disease by topical treatment? The gastric disorder does at times depend on erosions and granular degeneration of the cervix uteri, but not always. The theory of Graily Hewitt, that the symptoms referred to result from uterine versions and flexions, is a theory both true and false. In my own experience the worst cases I have ever been called upon to manage showed no alteration in circulation, structure, or position of any part of the uterus. There was no local disease of any kind. Of course no local treatment was instituted, yet I was compelled at last to employ the *dernier ressort*,—the emptying of the uterus. The most which can be said in reference to this section of management is that, after a thorough physical exploration of the condition of the pelvic organs has been made, any abnormality found should be corrected as speedily as practicable. Generally a considerable amelioration, if not a total arrest, of the gastric symptoms will ensue when the local mischief has been overcome.

5. *Obstetrical*.—Cases which have resisted all methods of treatment previously referred to—hygienic, dietetic, medicinal, and gynæcological—call for special obstetrical treatment. In a certain unknown percentage of cases death will surely follow unless means are taken to empty the uterus of its contents. There can be no question to a rational mind as to the perfect justifiability, on moral and legal grounds, of the induction of an abortion or a premature labor (almost always the former) in this class of cases in order to prevent death. A fearful responsibility, it is true, it is ; and in consequence of its gravity it is an obligation which should be shared with another for our own protection, if for no other reason. All the circumstances having been fully stated to the husband and immediate family, and their entire consent having been obtained, the abortion is induced as a *dernier ressort* to save life.

So indisposed are many physicians to assume this responsibility that this obstetric operation has no doubt been quite frequently deferred until too late. Having satisfied ourselves that naught else can be done to arrest the gastric irritability and tide the woman over until term, the time to empty the uterus should not be postponed. If unduly delayed, convalescence may be greatly protracted, or death may follow from exhaustion and inanition ; or, possibly, some secondary affection may develop. My personal experience is against wasting further time in the induction of cervical dilatation by the Copeman method.

I have usually resorted to the use of the elastic bougie or sound, after thorough vaginal irrigation with the bichloride solution, followed, if necessary, by a preliminary dilatation of the cervix uteri with a tupelo tent. In every instance save one the uterus has emptied itself completely within a few days, and very soon thereafter the stomach has regained its normal action, and complete recovery has resulted. In the case referred to death followed in three weeks, from a secondary pulmonary complication. Possibly an error in practice was made in this instance—seen in consultation several times—in postponing too long the operative interference, as I have seldom seen a patient more weakened and emaciated from any disease.



## PYOSALPINX; FIBRO-CYSTIC TUMOR OF UTERUS; PREGNANCY.

CLINICAL LECTURE DELIVERED AT COOPER MEDICAL COLLEGE, SAN FRANCISCO.

BY CLINTON CUSHING, M.D.,

Professor of Gynæcology, Cooper Medical College; Consulting Surgeon to French  
Hospital, San Francisco.

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GENTLEMEN,—We have, as material for the morning lesson, three cases of pelvic disease which will serve to illustrate some important points in differential diagnosis.

### PYOSALPINX.

The first woman is aged thirty-three, and has been married eight years. Her first symptom of pelvic discomfort occurred when she had been married two years, menstruation then becoming quite painful. She suffered from dysmenorrhœa until three years ago, when she applied at this clinic for advice.

The pain began several days before the appearance of the flow, and was sufficient to incapacitate her from any active exercise for nearly a week. The menstrual flow was excessive.

Upon examination the uterus was found to be fixed and extremely sensitive to touch. On either side of the uterus, by the bimanual examination, there was found an elastic mass, pressure upon which caused great pain. The diagnosis was made of pelvic peritonitis, with probable disease of the Fallopian tubes and ovaries.

Rest in bed was advised, with large vaginal injections of hot water night and morning, and a rectal injection of hot water once a day. This treatment was partially carried out, but the case went on from bad to worse, and at the end of six weeks she had a chill, followed by high fever and the constitutional symptoms of the presence of pus.

A digital examination now disclosed an elastic mass in Douglas's pouch, and the uterus crowded forward towards the pubes. The diagnosis was made of pelvic abscess and probable pyosalpinx. The

abdomen was opened and the diagnosis confirmed. Both the Fallopian tubes were much enlarged and full of pus. The right tube was of the size of my wrist and between seven and eight inches long, with its end terminating in Douglas's pouch. There were also in Douglas's pouch about six ounces of pus, walled in from above with an exudation of lymph. Adhesions were universal between the small intestines and the pelvic organs. The right tube was in a state of gangrene, and came away in fragments.

After removing the oviducts, with the ovaries, a rubber drainage-tube was passed through Douglas's pouch and out through the abdominal wall in front, and left in for a week. She recovered without further trouble. As a consequence of her long sickness she was not very strong for some weeks, but she is now, as you see, quite fat and well, though she is not yet strong.

Her sexual relations with her husband are not very satisfactory, for the removal of the ovaries has brought on the change of life. The uterus has undergone atrophy and is about the size that it was when she was a child. The uterus is quite fixed and immovable, and the vagina is more contracted and smaller than it was before the operation. As a consequence, the sexual act is attended with more or less pain, both to herself and her husband. There is a condition of anteflexion, but it is of no consequence, since her menstruation has ceased. There is not much tenderness in the pelvic region, but she complains of a sense of weight or bearing down.

I show you this case not only as an illustration of a common form of pelvic tumor, but I wish also to call your attention to a method of treating those women who come to you complaining of a sense of bearing down. Suppose a woman has a pelvic inflammation or a relaxed condition of the ligaments and tissues about the uterus, producing a sense of discomfort upon standing. She feels the need of some sort of

FIG. 1.

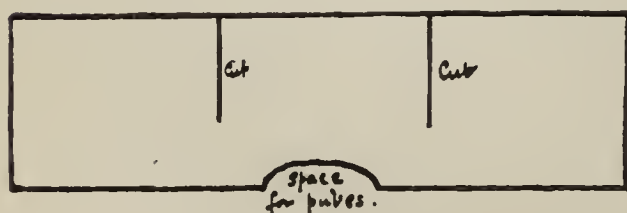


FIG. 2.



support on the outside to hold her up. This statement is especially applicable in the case of a woman just getting out of bed after some form of pelvic inflammation. Take a yard of belladonna adhesive



plaster eight or ten inches wide and cut it down in two places, as in the first figure. Strip off the cloth covering of the plaster and sew it together, as in the second figure, and carefully apply it to the abdomen, having clipped off the hair from the pubes. This keeps out the cold, protects the parts from the air, and keeps them well supported. This can be worn from one to two months. It is curative, inasmuch as it supports the parts and gives the woman a general feeling of comfort. It is a most useful bandage to be worn following confinement. It applies itself perfectly to the part and stays where it is put. This patient tells us that the plaster gives her a feeling of comfort and enables her to walk with greater ease.

#### FIBRO-CYSTIC TUMOR OF UTERUS.

The second patient is thirty-four years old, and has been married ten years. She has had pain in the pelvis for nearly six years, which is worst during menstruation. She was not constipated. The pain was worst in the region of the right ovary. Menstruation was regular, but painful. She was thin and had a tired, anxious, frightened look.

She came to us first six months ago. By means of the bimanual examination we found a soft, elastic mass the size of a small cocoanut in the right broad ligament, which was tender to the touch. Now, what was this mass? The diagnosis lay between an ovarian cyst bound down by adhesions, and an intraligamentous cyst, probably arising from the parovarium between the layers of the peritoneum which make up the outer coverings of the right broad ligament.

The uterus was pushed to the left and forward, and was movable. The uterine cavity measured two and three-fourths inches in depth.

I opened her abdomen at the French Hospital before the senior class, and found that the diagnosis was wrong. I found a fibro-cystic tumor growing from the posterior wall of the uterus and attached to that organ by rather loose connective tissue. The woman's body was placed at an angle of forty-five degrees, the hips being placed a foot higher than the shoulders, according to the method advocated by Trendelenberg, of Bonn, as illustrated by this diagram. (See Fig. 3.)

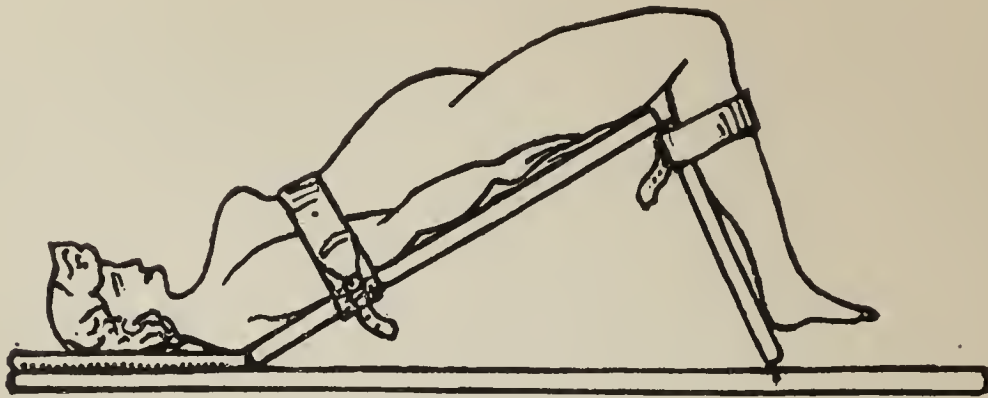
Now the small intestines and omentum gravitated downward against the diaphragm, and were entirely out of the way. The uterus was seized with a small vulsellum, and lifted out of the pelvis. The peritoneum was laid open directly over the growth, and with the fingers and the handle of a scalpel the tumor was enucleated. No vessels required ligation.

With a running catgut suture the subperitoneal tissues were drawn

together, and the peritoneal edges subsequently brought in position with a second row of sutures from the same piece of catgut. The abdomen was closed in the usual way.

No bad symptoms intervened until the end of the first week, when an increased temperature indicated the probable existence of pus. The

FIG. 3.



abdomen was reopened and several ounces of bad-smelling pus were found in Douglas's pouch. A rubber drainage-tube, passing through Douglas's pouch into the vagina and out through the abdominal wall, was left in for a week. A fæcal fistula formed and discharged for several days. This healed at once on removal of the drainage-tube. Thereafter convalescence was uninterrupted.

I herewith present the tumor for examination. You see it is a semi-solid mass and still elastic to the touch, notwithstanding it has been in alcohol for several weeks. She returns to the clinic to report, and, as you see, looks fat and strong, but complains of some pain in the back. Her menstruation is regular and not painful. The continuous current of galvanism will be used, from the sacrum through to the anterior abdominal wall, by means of large clay pads, for fifteen minutes twice a week.

#### PREGNANCY.

The next woman is thirty-three years of age and has no children. She has been married ten months. She has had dysmenorrhœa for years, and the marriage relation has not influenced the amount of pain. She complains of a sense of bearing down about the pelvis, and is unable to stand long without discomfort. She is constipated and has to empty her bladder frequently. She has some leucorrhœa.

It is forty days since her last menstruation. The first question that naturally arises is, Is she pregnant? She has no morning sickness. Her menstruations were formerly regular, and she never has been pregnant, though living with her husband ten months.

Upon making a bimanual examination we find the uterus enlarged



and the fundus resting on the rectum in a condition of retroversion. The os uteri is pointing forward instead of backward. The mass in Douglas's pouch, which I believe to be the fundus of the uterus, is somewhat sensitive to the touch.

By the bimanual examination I am unable to make out any pelvic tumor, excepting the mass in Douglas's pouch. The possibility of there being an impregnated, retroverted uterus prevents me from using the uterine sound to verify a diagnosis; therefore I place the woman on her elbows and knees, introduce a Sims's speculum, and on lifting the posterior vaginal wall the air rushes in, the vagina becomes ballooned, and the pelvic organs fall upward and forward.

Now, seizing the anterior lip of the cervix with a small vulsellum, I draw the uterus well down and move it about freely. By pushing the cervix well back towards Douglas's pouch the body of the womb is thrust forward. It now becomes manifest without the use of the sound that the tumor in Douglas's pouch is a retroverted uterus.

The cervix is now forced back still farther with a vaginal tampon of borated cotton, which the woman will wear for three days. Should it prove that without doubt this woman is pregnant, this procedure will not disturb the condition in the least.

Now, in regard to the diagnosis of pelvic tumors. Take the first case. We diagnosticated pelvic peritonitis. This opinion was based upon the fact that she had fixation of the uterus and great tenderness of the surrounding tissues, with increased temperature. That she had salpingitis or pyosalpinx, we believed, because she had had repeated attacks of pelvic inflammation, and experience has shown that salpingitis or pyosalpinx exists in nearly every case where a woman has such recurring attacks. In other words, disease of the Fallopian tubes is the common cause of pelvic peritonitis, the inflammation being set up by the escape into the peritoneal cavity of pus or muco-pus from the peritoneal end of the Fallopian tube. And, furthermore, I might here say that the opinion is becoming quite general among those who pay especial attention to the diseases peculiar to women, that a large proportion of all cases of tubal disease occurring in married women is due to gonorrhœal infection travelling from the vagina along the mucous membrane of the uterus into the Fallopian tubes.

In the second case the diagnosis was attended with much greater difficulty. There was no history of pelvic inflammation; merely an elastic tumor in Douglas's pouch of six years' standing, attended with pain; no constitutional symptoms; the tumor very slightly tender to

the touch, with moderately firm adhesions to the uterus, and with but very slight enlargement of that organ.

It was possible that this might have been an encysted abscess of long standing, but there were no constitutional symptoms to warrant the opinion, although it is true that we may have a collection of pus in the pelvic cavity for years without there being sufficient constitutional disturbance to attract attention. The fluid parts of the pus are slowly absorbed, the more solid, or cheesy, part becomes walled in by lymph, and the patient may suffer but a moderate amount of local or constitutional disturbance until some accident occurs which directs attention to the part.

It was probably not an hæmatocele, else it would not have remained so long without being absorbed. A fibroid or fibro-cystic tumor in this location is not usually tender to the touch and does not usually cause much pain. If the mass was an effusion of lymph from pelvic peritonitis, we would expect a history of pelvic inflammation and a greater amount of fixation of the pelvic organs. That it was not a mass of fæces in the rectum could be verified by rectal examination; so we were forced to the conclusion, from its elasticity and partial mobility, together with a certain amount of tenderness upon pressure, that it was an ovarian cyst which had formed adhesions to the surrounding parts, or that it was an intraligamentous cyst.

It is sometimes a very difficult thing to make a positive diagnosis of a cystic or fibro-cystic tumor. Indeed, the differential diagnosis of abdominal tumors in many instances is attended with a great deal of uncertainty. It is largely a matter of opinion. In this particular instance it might have been an extra-uterine pregnancy. The foetus might have died and become encysted; but there was no history to lead to that conclusion. The menstruation had been regular. The aspirator would have shown conclusively the existence of pus, but experience has proved that the use of the aspirator is not unattended with danger. It is difficult to keep the vagina antiseptic, and infectious particles will get through the puncture and so set up local infection.

The more I have to do with this class of cases, the more sure I am that an exploratory incision, in all cases where a tumor exists that causes sufficient pain or interference with the comfort and health of the woman to warrant any kind of surgical interference, is the better plan of procedure. Properly done, by a clean man with clean assistants, clean hands, clean sponges, clean instruments, and clean surroundings, the risk is exceedingly small; and when the abdomen is opened we are



at once in a position to make a correct diagnosis and do the best possible thing for the patient.

Now, in regard to the third case,—that of retroversion of the uterus. The question to settle in making the diagnosis was, whether the mass in Douglas's pouch was a retroverted uterus or some form of pelvic tumor.

Let me here make a few suggestions to you in a general way regarding the abdominal exploration of the pelvis. In the first place, never undertake to examine a woman without having all constrictions about the abdomen and waist removed. A woman is so accustomed to having a tight corset and a lot of petticoats fastened tightly about her waist, and becomes so habituated to this constriction, that she will assure you that her corset is perfectly loose when it is well-nigh impossible to squeeze one or two fingers between it and the body. Now, it is very interesting to observe that if an attempt is made at an examination without loosening this constriction, the stomach and intestines are crowded down into the lower part of the abdominal cavity in such a manner as to interfere very materially with any satisfactory examination. The moment the constriction is removed, the abdomen flattens out when the woman lies down upon her back, and the advantage to the examiner is manifest at once.

Now, with the woman lying on the table with the knees well drawn up and a large pillow under the head and shoulders, the abdominal wall is relaxed, and with one or two fingers in the vagina and the other hand upon the abdomen, unless the woman be exceedingly fat or the abdominal wall be rigid through muscular contraction from fear, any abdominal growth of the size of a hen's egg can usually be made out, if only time and patience are used. If there be a question of uncertainty, reserve your decision until after a second or even a third examination.

The manipulation should always be done with the greatest gentleness and with as little excitement as possible, for if the woman be hurt or frightened and the abdominal wall thereby rendered rigid the difficulties are greatly increased.

It is always well to have the lower bowel thoroughly evacuated by several large enemas before the examination is begun. This enables you to make a rectal examination, and you can reach from one to two inches higher up into the pelvic excavation by the rectum than you can by the vagina.

In a difficult and obscure case, especially where the woman is apprehensive and nervous, a much more thorough examination can

be made when the patient is placed under the influence of an anæsthetic.

Let me advise you, when opening the abdomen for some form of tumor or disease, to speak of your procedure not as an operation for this, that, or the other kind of tumor, but say, rather, that you are going to make an exploratory incision. The importance of this advice will be made manifest to you when I tell you that one of the most famous abdominal surgeons invited me, several years ago, to come to his hospital to see him extirpate a fibroid tumor of the uterus through an abdominal incision. Upon opening the abdomen his supposed fibroid tumor of the uterus proved to be a sarcoma of the kidney.



## TUBAL PREGNANCY.

CLINICAL LECTURE DELIVERED AT THE COLLEGE OF PHYSICIANS AND SURGEONS,  
MEDICAL DEPARTMENT OF COLUMBIA COLLEGE, NEW YORK.

BY GEORGE M. TUTTLE, M.D.,

Professor of Diseases of Women, College of Physicians and Surgeons, Medical Department of Columbia College, New York; Attending Gynæcologist to the Roosevelt Hospital; Consulting Surgeon to the New York Cancer Hospital and to the Woman's Infirmary.

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GENTLEMEN,—I have a specimen of unusual interest and rarity to present to you to-day. As you know, the subject of tubal pregnancy has been very much elucidated within the last few years. It was formerly supposed that it was impossible to make a positive diagnosis of tubal pregnancy, but cases in which this has been done have accumulated with great rapidity. There is still considerable difference of opinion about many points connected with these cases, so I must bring before you the conclusions at which I have arrived from my own experience. This subject comes before each and every medical practitioner who attends women, and death is usually so speedy that the recognition of the condition is of unusual importance. The surgeon does not see the cases until the family physician has made the diagnosis. In the present instance the diagnosis was made very brilliantly by one of our recent graduates.

The patient, a resident of this city, is thirty-two years of age, strong, healthy, and well built. She has been married thirteen years, and had never skipped a menstrual period before this trouble. Please bear in mind this important point. Although she and her husband were anxious for offspring, she remained sterile. A year ago she attended the Vanderbilt Clinic to be treated for painful menstruation. She had a history of such menstruation ever since girlhood, suffering terribly for a day or two from expulsive uterine colic. She was only partially relieved by treatment.

About a month and a half ago her menstrual period failed for the first time to appear. Soon after this date she began to suffer from

nausea, which at first occurred in the morning, but later on was present during most of the day. There was absolutely no flow of blood until the 17th of last month, when the next period was due. At this time, —*i.e.*, two weeks ago,—she took two anti-bilious pills, and immediately afterwards suffered from severe abdominal distress, without faintness or sign of internal hemorrhage. The next day a slight bloody trickling from the uterus began, and this has continued ever since. At about this time she noticed a sense of fulness with tenderness of the breasts, then the elevation of the small glands around the areola developed, and soon a little serous fluid could be squeezed from the breasts. She has always suffered from constipation, and she attributed her pain to wind-colic. Such breast signs in a nulliparous woman were almost positive indications of pregnancy. The most important single symptom of tubal pregnancy is pain, and her attending physician attributed her pain to this cause. The pain was localized, sharp, stabbing, and limited to one side. There was no change in the pulse or temperature. The physician found enlargement of the uterus, softening of the cervix, and blueness of the vagina. Three days ago she had much trouble in moving the bowels, and this was followed by faintness and blanching of the face. Her pulse was 130, there was no fever, there was some abdominal tenderness, but no tympanites, and the patient felt apprehensive. Per vaginam, something “boggy” was felt behind the uterus, and this was at first thought to be a pelvic hæmatocele. Now, pelvic hæmatocele in ninety-nine cases out of a hundred means a ruptured tubal pregnancy. I was at this time asked to see the case with her physician. Under chloroform, I found the uterus was enlarged, as it always is in tubal pregnancy. The softening of the cervix was so slight that one could not in this case consider this sign of much value as indicative of pregnancy. The uterus lay towards the patient’s left side, and rather high, showing that it was pushed upward and forward and to one side, and a somewhat soft, fluctuating, and immovable mass was found to be the cause of this displacement. This mass felt very much like a placenta, and over its surface large pulsating vessels could be felt.

A woman’s life really hangs upon the answer to the question as to whether the hemorrhage from the ruptured tube takes place intraperitoneally or extraperitoneally. If the rupture be extraperitoneal, the blood passes between the two layers of the broad ligament, and the majority of cases recover with but very slight symptoms, and, as a rule, do not need surgical interference. I have met with at least a dozen cases with a similar history, which have recovered without any



interference, but the physical signs were very different from those presented here in our patient. Rupture between the layers of the broad ligament produces a mass which projects deeply down into the pelvis, and gives a peculiar constriction of the rectum, which is one of the best signs we possess of blood effused in this way. In such a case your finger passes about two and a half inches up the rectum, and feels a tight, hard, annular constriction. In this case the effused blood did not produce any such constriction, but it was felt more particularly at the pelvic brim, and hence I concluded that the hemorrhage was intraperitoneal. No less an authority than Lawson Tait maintains that if the blood be effused into the peritoneal cavity death is speedy and inevitable, and that there is no tendency for the blood to coagulate when poured out here. The history of many cases after abdominal operations supports such a view, but there are instances showing that there may be a slow, gradual hemorrhage into the peritoneal cavity without any other signs than those already enumerated.

Let me now show you the specimen. I first show the placenta, next a blood-clot containing the embryo, which was found projecting from the end of the Fallopian tube. Here is the foetus, which corresponds in its development exactly to the period of gestation indicated in the history. Finally, I show you a mass in which are seen the ovary and the end of the Fallopian tube where I cut it off close to the uterus. You will notice that this portion is not much dilated, but the fimbriated extremity is converted into a large sac. The fimbriae are plainly visible, and the embryo has escaped from the end of the Fallopian tube. It is this point which I consider one of peculiar interest.

I operated upon the patient yesterday afternoon, and on reaching the peritoneum I saw that it looked blue, as it usually does when there is a hemorrhage into its cavity. On incising it I found a number of large blood-clots, and passing my hand down into the pelvis I felt the mass, the situation of which has been already described. Lawson Tait and others maintain that when the blood is so effused into the peritoneal cavity there is no tendency for it to be shut off by adhesions, but here is a case where there was unquestionably free blood in the peritoneal cavity, and below this was a mass more or less shut off by plastic lymph due to a localized peritonitis, as was proved by the fact that it was necessary to ligate a portion of the adherent omentum.

There is much difference of opinion as to the mode of treating tubal pregnancy. Many high authorities claim that the proper and most conservative treatment is to kill the foetus by electricity, providing you have made the diagnosis at an early period and before

rupture. This one point has caused much acrimonious discussion. I have maintained that the proper treatment is to cut down and take it out. Why? Because if you kill the foetus the placenta may continue to grow, and the case may prove fatal even after this.

You will remember that at the free end of the Fallopian tube there is a ring of peritoneum, beyond which are a number of fimbriæ. Bland Sutton, of England, the most eminent authority on the pathology of this condition, has shown within the past few weeks that this tubal end is not closed until about the eighth week. It was formerly supposed that the fimbriated extremity of the Fallopian tube was closed by a sort of adhesive inflammation, but Sutton has shown that this is not the case, but that the swelling of the mucous membrane and the distention of the tube cause this ring to project beyond the fimbriæ, so that finally the Fallopian tube is closed thereby. My specimen here shows this, and this is the most striking point in connection with the case. It shows that there may be an abortion from the tube, just as there is an abortion from the uterus. In many cases of uterine abortion there is an apoplexy which dislodges the ovum and causes its expulsion. When the ovum is expelled, it is found to be round and oval, and on section laminated, and in its centre is seen a clear translucent membrane. In most cases you find no remnant of the foetus. Our patient had an arrest of the ovum in the outer part of the tube, brought about, probably, by chronic tubal disease. There is no ground for believing that under normal circumstances impregnation takes place anywhere else than in the uterus. As the ovum developed the tube enlarged, and finally hemorrhages took place, which were coincident with the attacks of pain from which the patient suffered. These hemorrhages interfered with the vitality of the ovum, and, as this was prior to the eighth week, the end of the tube was not closed, and hence blood probably leaked out from the end of the tube into the peritoneal cavity. Finally a larger quantity of blood was poured out, and was isolated by adhesions. I found the foetus hanging from the Fallopian tube; in other words, a tubal *abortion*, not a tubal *rupture*. Up to very recently it has been stoutly maintained that where there is such a hemorrhage there is always a rupture of the tube. Now that we know more about this subject we may expect to find these cases much more frequently. Many vague attacks of colic are probably due to the escape of small ova, which have developed in the Fallopian tube, and have dropped into the peritoneal cavity. Under such circumstances there is slight constitutional disturbance, and after a few days of rest in bed the patient recovers.



If it be true that the end of the Fallopian tube remains open up to the eighth week, what can be accomplished by electricity? You may kill the embryo, but it is likely that you may at the same time cause muscular peristaltic action in the tube, such as occurred in this case, resulting, as it did in this case, in a contraction of the tube, a little leakage, a sudden expulsion of the ovum into the abdominal cavity, and, finally, a severe hemorrhage. When there is a mass here which is fraught with so many dangers for your patient, what is the sense of leaving it when you can by a relatively safe and simple operation save her? Every case I have so far met with has only served to make me a firmer believer in the wisdom of the rule which I would impress on your minds,—to cut down upon such a mass and remove it. I am happy to say that this opinion is gaining ground. I have operated upon twelve cases of tubal pregnancy, and have saved every case but one, that one being almost moribund and unable even to give her name when brought to the hospital in the ambulance. In another case almost as desperate the patient was saved when we thought there was really no hope.

# METRORRHAGIA AND MENORRHAGIA OF TUBAL ORIGIN; LAPAROTOMY; CURE.

A CLINICAL LECTURE DELIVERED AT THE BALTIMORE MEDICAL COLLEGE.

BY THOMAS A. ASHBY, M.D.,

Professor of Diseases of Women, Baltimore Medical College; Fellow of the American Gynæcological Society, etc.

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GENTLEMEN,—The case I present to the class to-day is that of a patient who has been before you on a previous occasion. She is thirty-seven years of age, a multipara, her youngest child being ten years of age. Since the birth of her last child she has suffered from uterine and intrapelvic disease. She entered the Maryland General Hospital for treatment some four weeks ago, and presented a history of continued and excessive uterine hemorrhage at and during the intermenstrual period.

This hemorrhage at times is excessive, the blood coming from her in such streams as to produce both alarm and depression. There is an intermittent and irregular action in the flow quite out of the ordinary line of conduct in such cases. She tells me that at irregular intervals she has to all appearance only a moderate show, and then on taking the least exercise, a stream of blood comes pouring out of her vagina and deluges her clothing. This spasmodic flow now ceases, and for several days there is a very slight show. The reservoir of contained blood seems, as it were, to empty and refill at no stated interval of time.

Many of you will remember that I presented this case to the class three weeks ago, and then explained her symptoms and history. Up to that time I had been unable to find a satisfactory cause for her symptoms; and in your presence I had the patient anæsthetized, and made a thorough examination of her intrapelvic organs.

Anæsthesia was given to relax the abdominal muscles and to facilitate a more thorough exploration of her pelvis. Within recent years I have used anæsthetics more and more as an aid to the diagnosis of intrapelvic conditions. Where patients have thick and resistant ab-



dominal walls, as is the case with this woman, or where they are nervous and hyperæsthetic, I find anæsthesia a prerequisite to a successful diagnosis. I have yet to witness any unpleasant effects from its employment, and have found the most satisfactory results through its influence. My invariable rule is to administer chloroform to the point of laxation, and not to the point of profound anæsthesia. I have time and again examined patients thus anæsthetized with less than one drachm of chloroform. I have made it a rule always to have an assistant to administer the anæsthetic.

In the case of the patient now before you, you will recall the fact that I made a thorough examination, and found no satisfactory condition to account for the source of her hemorrhages. There were present some evidences of an old intrapelvic inflammation, but no distinct tumor and no adhesions, her uterus being freely movable in the pelvis. On passing the sound into her uterus I found an indurated condition of the internal os, which was occasioned by an interstitial deposit of fibrous material. In other words, the patient had a small interstitial fibroid tumor, and I inferred that this condition might have an etiological influence in the production of the hemorrhage. While she was under the anæsthetic I curetted her uterus in your presence, but removed little if any tissue. I stated at the time that the hemorrhage most probably had a different origin, but that its cause was at present obscure.

The patient was returned to the hospital, and there remained under observation. No unfavorable symptoms followed the anæsthesia or curetting; but within three days' time she experienced another copious loss of blood, the flow lasting a few hours, and then diminishing as on previous occasions.

A few days subsequent to this I examined her in the operating room of the hospital, and at this time detected a small intrapelvic tumor of a sausage shape and feel, not unlike the so-called pus-tube. I then realized that the origin of the hemorrhage might be either ovarian or tubal. In previous examinations I had not detected any appreciable disease of the tubes or ovaries.

After conference with the patient, I decided that the only course to pursue in her case was to open the abdomen, and, if possible, remove the offending parts. I explained to her that it would be necessary to remove both ovaries and tubes if a restoration to health was desired. The patient is a domestic, and for some years has made her living with great difficulty, having to endure many weeks and months of invalidism. An attempt at relief is considered by her not only desirable but im-

perative, and she cheerfully assents to the element of risk which laparotomy involves.

I have, therefore, brought this patient before the class for operation, as she seems to present a typical case for the exploratory incision as an aid to diagnosis, and will enable you to witness the technique of an abdominal operation under exceptionally favorable circumstances. I have placed the operating table in such a position that I can demonstrate every step, and show you the details of making an incision through the abdominal walls ; and whatever steps that may be required to diagnosticate and remove the condition found. I wish to impress upon you the fact that I am in doubt as to the condition I shall find in this woman's pelvis ; and I shall do this laparotomy for two reasons : *first*, to ascertain whether her tubes and ovaries are diseased, and whether, pathologically speaking, they account for the patient's symptoms ; *second*, if I find both tubes and ovaries in a sound condition, I must assume that the hemorrhage is of uterine origin, and I shall remove these organs. Under either circumstance the operation for the removal of the uterine appendages will be done. It is not, therefore, an exploratory incision in the usual sense, but a determination in advance to bring about an artificial menopause.

I shall first explain the technique of this operation in a very brief way. Everything about the patient and her surroundings has been made as clean as possible. All instruments, sponges, and appliances have been sterilized and rendered as aseptic as possible. The patient's bowels have been moved, she has been bathed, scrubbed, and dressed in clean linen. Her abdomen has been shaved and then washed in bichloride of mercury solution. My own hands and arms and those of my assistants have been rendered as near aseptic as possible. The patient is now anæsthetized, and I shall proceed to open her abdomen. An incision, three inches in length, is first made through the skin in the median line and midway between the pubes and umbilicus. I first stop all bleeding vessels with the Péan forceps, and then, step by step, incise through fascia and muscle until the layer of subperitoneal fascia is reached. The wound is now sponged and dried for a moment until all capillary oozing ceases ; then, with a scalpel and a grooved director, I gradually incise until the peritoneum is reached. This is carefully drawn out and a very small opening is made, through which the grooved director is readily passed. The steps for enlarging the incision are simple, and, if carefully made, no danger to the intestines need be feared. After enlarging the incision through the peritoneum to the extent of the cutaneous incision, the walls of the wound are



drawn apart with a pair of catch-forceps, which grasp the peritoneum on either side and give a firm hold on these tissues.

You will observe that the walls of this woman's abdomen are unusually thick. She has over an inch of adipose tissue between the skin and muscle, and I should say that the total thickness is not less than two and a half inches. This has made the diagnosis more difficult than it would otherwise have been, and, together with an unusually deep pelvis, has prevented me from arriving at an accurate opinion as to the condition of her tubes and ovaries. I again repeat what I have stated, that I have no definite opinion as to the condition of her intrapelvic organs, though I shall expect to find evidences of tubal and pelvic inflammation.

Having opened the abdomen, I pass in the index-finger of the right hand, and search for the tubes and ovaries. I explore with care the entire pelvis, and, while I find no dense adhesions, I detect loose and friable bands, which indicate that this patient has had a mild form of intrapelvic peritonitis. These adhesions are very easily broken up, and as I carefully push them aside I come to the tube and ovary on the right side. I now pass my two fingers under the tube and lift it into view. As I bring it out through the abdominal opening and hold it up before you, you will observe two things: first, its unusual size; second, its soft, compressible condition. To be accurate, this tube measures four and a half inches in length and one inch in diameter. Its fimbriated end is closed and apparently destroyed. You will observe that it is attached to the ovary, which I now bring into view.

As I trace the tube from the fundus uteri to the ovary it looks not unlike a sausage, and very closely resembles a pus-tube. I notice in handling the tube that it has diminished somewhat in size, as if some of its contents had leaked out, and this has actually taken place, for the uterine orifice of the tube is open, and free communication exists between the tube and cavity. Here is a possible explanation of the uterine hemorrhage. I shall now throw a ligature around the tube as close to the uterus as I can place it and then remove the tube and ovary *en masse*. If my assistant will carefully lift up the tube and draw it out, I can make this demonstration perfect. The tube and ovary are now entirely outside of the abdominal cavity, and by depressing the abdominal walls I can show you the fundus, with the tube coming off from it. I shall first transfix the tube with a pedicle-forceps, with which I seize a strong silk thread doubled. This I draw through the pedicle, and catching one end in the loop I make the famous Staffordshire knot. I draw upon the ligature until it is firmly and securely

tied. I now remove the tube with a pair of scissors, taking care not to cut the ligature, and to leave a good stump.

As I cut through the tube you will observe that it immediately collapsed, and that its contents escaped. I now pass the tube around on a plate so that you can examine it. I shall not stop here to explain its pathology, but shall proceed to remove the tube and ovary on the left side. I find the tube on this side almost identical with the one just removed, but the left ovary is firmly adherent to the pelvic wall, and evidently cystic. As I attempt to enucleate it, it breaks down, and I can only remove its fragments. I shall, however, remove the tube as in the first instance. This is easily accomplished, as the adhesions are very friable.

Having removed the right ovary, both tubes, and a portion of the left ovary, I shall make the toilet of the peritoneum. You will observe that in this operation there has been no hemorrhage worth speaking of. Nothing has gotten into the pelvis except my own hands. I shall, however, carefully sponge out the pelvis before closing the abdomen.

I now close the abdominal wound with strong silk thread. I wish you to observe that I pass the threaded needle entirely through the abdominal wall from skin to peritoneum, so as to include all layers of tissue. I place the sutures very close together,—*i.e.*, at a distance of less than three-eighths of an inch. In this incision of three inches I have now placed ten interrupted sutures. I again sponge the wound and peritoneum before tying the sutures, to make sure that all hemorrhage has ceased, and that the peritoneal cavity is thoroughly cleaned.

The operation is now complete, and my assistants will put on the abdominal bandage and dressings while I explain the condition of the tubes to you. You will observe that, as I hold up this tube before you, it has the appearance of a hollow cylinder which has collapsed from an escape of its contents. Its walls are somewhat thickened and hypertrophied, and its cavity is so enlarged that it will measure at least a half-inch in diameter. I will now open the tube with a scalpel, and as I do so there is an escape of dark, grumous blood, but no blood-clots. The mucous membrane is hypertrophied, thickened, and thrown into numerous folds. It is very hyperæmic and in a pathological condition. The mucous membrane has been pouring out neither pus nor watery serum, but has been sweating out a dark, venous-looking blood. This blood has accumulated in the tube from time to time, and, whenever the cavity of the tube was over-distended, by a spasmodic action the contents of the tube were ejected into the uterine



cavity. You will observe that the fimbriated end is entirely occluded, so that the blood has not escaped into the peritoneal cavity.

The condition of the tube entirely explains the physical condition of this patient prior to the operation. Her symptoms are now fully accounted for. The source of hemorrhage has been tubal, not uterine; and, if the patient recovers from the operation, you will find that her hemorrhage will entirely cease. A complete restoration to health should ensue. This is the only case of this character which has ever come under my observation, and I cannot recall a case of similar nature on record which has come within my knowledge. In this patient, as a result of intratubal inflammation, the mucous membrane has become so thickened and altered in its function that a dark sanious blood has been leaking from its capillaries for months past. Fortunately, the uterine orifice of the tube remained open, and, as the reservoir made in the cavity of the tube filled, it intermittently overflowed, thus preventing a greater enlargement of the tubes. My theory is that, in my first examination, I found the tubes in a partially collapsed state, and hence could not make out their physical condition. In a subsequent examination, when I detected a sausage-shaped tumor in the pelvis, the tube was evidently filled.

I was not prepared to find a condition of this character, and hence a laparotomy was proposed to clear up the doubt and to remove both tubes and ovaries in order to induce an artificial menopause.

The larger my experience grows in abdominal work the less confidence I have in the accuracy of a diagnosis prior to opening the abdomen. There are many conditions which can be diagnosticated with precision, but many more which present very different pathological features from those assumed to exist before the laparotomy. In carefully selecting cases for laparotomy, it is less important to know what the condition is than to be assured in our own minds that the symptoms and physical condition of the patient warrant or demand surgical interference.

The patient has borne the operation well, and she has been relieved of a condition which could only be removed by an abdominal section. The chances in favor of her entire recovery are good.

[*Later Note.*—This patient made a rapid recovery, and, when seen four months subsequent to the operation, had had no return of hemorrhage, and expressed herself as being in perfect health.]

## THE INDICATIONS FOR CRANIOTOMY, WITH ILLUSTRATIVE CASES.

CLINICAL ARTICLE WRITTEN EXPRESSLY FOR "INTERNATIONAL CLINICS."

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THE object of craniotomy is to lessen the volume of the foetal head. This is done either to overcome a disproportion between the foetal head and the maternal pelvis (whether this be occasioned by a deformed pelvis, tumors, or by hydrocephalus, malposition, or malpresentation of the foetal head), or to make the delivery less dangerous for the mother.

The indication for this operation varies according to whether the child be alive, dying, or dead ; whether the obstetrician be accustomed to do laparotomies, and whether the condition or surroundings of the patient will admit of election of Cæsarean section in preference to craniotomy.

Most frequently perforation is necessitated by a contracted pelvis. About ten per cent. of all women have anomalies of the bony passages, and in about three per cent. these anomalies will give rise to dystocia, necessitating operative interference. It is, therefore, of primary importance that the physician should be able to measure this contraction. The one measure constantly with him and always ready is, and will always remain, the physician's own hand. Only by a constant practice will he be able, however, to estimate the true conjugate diameter from measuring the oblique conjugate diameter. Therefore each and every parturient woman ought to be examined at the earliest convenient time, to find out whether the bony passages are normal.

*While a pelvis with a true conjugate diameter of two and a half inches or less will always necessitate Cæsarean section, craniotomy of the child and its extraction is possible, and at the present day always accompanied by less danger to the mother, in a more roomy pelvis. Now, it*



very frequently is perfectly permissible for an expert obstetrician who has command of good assistants, has done abdominal sections, and can place his patient in the best possible surroundings, to forego the killing of a living child by choosing Cæsarean section in preference to craniotomy, when the pelvis is contracted from two and a half to three and a quarter or three and a half inches, and a perforation would be possible and less dangerous for the mother; but his less fortunate brother, who has just as well diagnosticated the improbability of the passage of a non-mutilated child, will still many a time, with a sore heart, be obliged to craniotomize a living child, if it be necessary for the interest of the mother to deliver quickly, if assistants and nurses cannot be obtained, and if his practice lie among the ignorant, the great unwashed, the people who cannot and will not give the necessary attention to cleanliness, a laparotomized patient, or an asphyxiated child.

The relative indication, then, for Cæsarean section is, practically speaking, only permissible to a surgeon at a maternity hospital.

Totally different is the indication if the child be dead or dying. Here, without any exception, the conscientious accoucheur will prefer the less dangerous extraction of a craniotomized child to a high forceps application or a difficult version; but, again, it is only by practice that the well-being of the unborn infant can be diagnosticated.

Whenever the foetal pulse becomes slower than 100, or rises above 160; when the prolapsed cord gives feebler and feebler pulsations; when a head-swelling is rapidly appearing, or a previous tense swelling loses its elasticity; when the meconium shows itself on the examining finger in a head-presentation, the child is sure to come into the world asphyxiated at best, and such signs will do much to mitigate the uncanny feeling of killing a living being. Should a later auscultation show that the foetal heart has ceased to pulsate after any of these preliminary symptoms, craniotomy is surely preferable, wherever the mother shows signs of suffering, to any other mode of delivery.

Again, constant practice is necessary to differentiate between the subjective symptoms of suffering on the part of the mother and the objective symptoms, which the physician is able to recognize.

An elevation of the temperature of the pregnant woman above  $102^{\circ}$  F., a constant pulse of 120 or more, an ill-smelling discharge from the genitals, will show us that the time for delivery has come.

Any accident or complication, such as eclampsia, syncope, rupture of the uterus while the head is within the pelvis, carcinoma of the cervix, tetanus of the uterus when the ring of contraction becomes

apparent near the umbilicus, or an enormously-distended bladder, the evacuation of which is impossible on account of the impacted head, will frequently necessitate craniotomy as the least hurtful operation after a careful attempt with forceps has proved futile.

On the part of the child, hydrocephalus or an extremely large and ossified head will also constitute an indication for craniotomy.

Many methods have been tried to estimate approximately the size of the foetal head, with a view of determining at the beginning of labor whether its passage unmutilated is possible or not. The only reliable one, and the one always at hand, is to grasp the head firmly with both hands from the outside and to try to squeeze it into the pelvis. If this manœuvre be possible (in narcosis, and the bladder being empty), it is also very probable that the natural forces will be sufficient to engage the head and deliver the child.

Should a large vertex rotate posteriorly and not continue its descent for several hours while the mother's soft parts meantime become oedematous, a careful attempt with forceps is certainly permissible; but, if not successful, craniotomy ought immediately to follow.

In fact, this preliminary application of forceps as a last resort ought never to last one or two hours, as unhappily occurs at the present day, but six or eight judicious tractions are all that are required or permissible.

A face presentation, mento-posterior, will always demand craniotomy if version be impossible, as will also a brow presentation if it cannot be changed into a face or a vertex. Should a version, for some reason, have been performed and the after-coming head prove too large to pass through, after the attempt at extraction has lasted more than five minutes and the child is, therefore, dead or dying, craniotomy is preferable to an injudicious application of forceps or a brutal employment of manual force, which will either tear the lower jaw or the head from the body.

Of course, it has to be taken into consideration whether the mother be a primipara or a multipara, and, in the latter case, we have to determine whether it be possible to induce premature labor, if we see the mother in time, and if we know that in the previous labor the infant had to be sacrificed on account of the pelvic contraction. It is a well-known law that each succeeding pregnancy will give larger children from the same mother and the same father; and, other things being equal, a strong and healthy mother will have better uterine contractions, and will have more chance of pressing the foetal head even into a contracted pelvis than a weak, extremely young, or very aged woman.



All of these factors will help to form the indications in each individual case; and it is only by paying attention to all the surrounding circumstances, and after having given the fullest consideration to the possibility of saving the child's life, that we shall be able to select craniotomy as the operation which, if performed in time, will usually save the mother.

I shall endeavor to illustrate the above remarks by a few pertinent cases taken from my record-book.

CASE I.—Mrs. B. S., aged twenty-four, primipara, previously healthy, was first seen by me four hours after labor had set in, and in the moment in which she was having an eclamptic attack. From the history I learned that this attack was the second inside of one hour, and that the midwife had left her, telling the people to send for the physician. Dr. G. not being at home at the time, I received the call. The head was engaging, os dilated to the size of a silver dollar, membranes not ruptured, and the pains were good, strong, and regular. Child alive and well. The bladder contained a couple of ounces of highly albuminous urine. While I was examining the patient Dr. G. arrived, and we agreed to await developments.

The ordinary treatment was followed; hypodermics of morphine and an enema of chloral hydrate were administered, and my colleague agreed to watch the case, with instructions to send for me if no progress had been made, or if any accident or very frequent uncontrollable attacks of eclampsia should recur. The next day I was told that the patient had died ten hours afterwards undelivered. She had had only five more attacks, which were controlled by chloroform, and the doctor was perfectly able to diagnosticate the death of the infant six hours previous to the death of the mother. That would have been the time when craniotomy was indicated, when it would have been comparatively easy of performance, and would perhaps have modified the course of this most unfortunate complication.

CASE II.—Mrs. Y., thirty-three years of age, fourth para, was seen by me in consultation, and the following history elicited. Within the four years of her married life this unhappy woman had been delivered three times of dead children. The first one was born spontaneously after a prolonged labor of thirty-six hours. The second was extracted after a lengthy forceps operation, and the patient subsequently went through a four weeks' attack of puerperal fever. The third child had been hydrocephalic and was craniotomized. The examination showed an extremely poorly nourished, rachitic woman, having weak pains, and a pulse of 120. She had been in labor for ten

hours. The membranes had ruptured; the head was wedged against the superior strait; the pelvis contracted to nearly three and a half inches; the os fairly well dilated. After considering the previous experience, together with her high pulse and the very thin uterine walls, I estimated that the danger which would accompany an attempt at version was great, so that I immediately craniotomized the living child and delivered the woman without any mishap. She made a quick recovery, and died of rupture of the uterus at her next confinement, because the midwife whom she had consulted about the induction of premature labor, which I had advised at a possible future pregnancy, had pronounced against this experiment. When full term arrived, the obstetrician who was in attendance decided upon the use of the forceps. It was probably a very high application and a difficult matter, and the patient died during delivery.

This woman, if put into better hygienic surroundings, would probably have been able to embrace a living child if after a proper interval premature labor had been induced, or even if Cæsarean section had been performed at a maternity hospital.

CASE III.—Mrs. R., primipara, with a generally contracted pelvis, the conjugate diameter of which measured nearly three and a half inches, was seen by me after version had been performed on account of prolapse of the funis. The attempts at extracting the after-coming, extremely large and hard head had been such that the vertebral column had given way and the trunk was hanging by the soft parts only. The whole perineum had been ruptured. The prolonged manipulation had made the vulva three times its normal size, with discolored spots, and the patient was exhausted and had a rapid pulse. The after-coming head was craniotomized and extracted. The patient died a week afterwards of septicæmia. Comment is not necessary.

CASE IV.—Mrs. B., twenty-five years of age, primipara, had been in labor for twenty-four hours, and her physician sent me a note asking me to bring my craniotomy instruments. The patient was a robust but very sensitive female, who had not permitted her physician to absent himself during the whole period. She wanted to be delivered; but happily the doctor had diagnosticated the contraction of the pelvis to three and three-fourths inches, had relied on her strong pains, and had made no attempt to apply the forceps to the head, which was wedged against the superior strait. The patient's pulse was 100; temperature 100° F.; os fully dilated; membranes ruptured ten hours before; extremely good expulsive pains; slight swelling of the head of the child. The patient, her relatives, and the nurse were clamoring



for a quick delivery. In the interval of a pain the foetal heart was heard beating normally. I advised waiting, and had the pleasure of seeing a child born spontaneously six hours afterwards whose malformed head regained its normal shape in a short time, and who is now growing up a lusty boy. In this case any interference would, in my opinion, have been criminal as long as the condition of mother and child were normal, though I certainly do not blame my weary brother if he wanted relief after twenty-four hours of waiting.

To sum up: First. Craniotomy of a dead child may be practised and is preferable to a high forceps application or to version.

Second. Craniotomy of a living child is justifiable if the foetus be a hydrocephalus; if the head be engaged in a malposition, the labor of long duration, with either a suffering mother or a weak child; if an attempt with forceps has proved futile, or if, after version, the disproportion between the foetal head and maternal pelvis be too great.

Third. Cæsarean section is justifiable and may be imperative to the obstetrical surgeon who can choose his time, his assistants, and has all the appliances of a well-regulated hospital and his own ripe experience at his disposal. It is not permitted to the general practitioner as long as embryotomy is practically without danger to the mother, while Cæsarean section still represents a mortality of more than seven per cent. in the hands of the most expert surgeons.

# Neurology.

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## MALARIAL PARALYSIS.

CLINICAL LECTURE DELIVERED AT THE PENNSYLVANIA HOSPITAL.

BY J. M. DA COSTA, M.D., LL.D.,

Physician to the Pennsylvania Hospital.

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GENTLEMEN,—I present you this morning a case of paralysis of unusual kind, one that will repay a close analysis. The patient, a man twenty-one years of age, has been in the hospital for some time, and we have had full opportunity of watching the varying features of his malady. He was admitted on the 2d of September. His illness began seven days before, while at sea and a few days after leaving Savannah, with intense occipital headache, and a violent chill followed by fever. The fever continued for three days; then another chill occurred, and he became delirious. There was a third chill the day before admission. On admission he was shaking violently, the tongue was furred, he vomited, the spleen was found to be much enlarged, the temperature was 106° F.; he was evidently suffering from a severe attack of remittent fever. Under decided doses of quinine, aided by phenacetin, the fever subsided in two days, the morning temperature being 98.6°. He sweated profusely and complained of excessive thirst. In the next few days the apparent convalescence continued, and the quinine was reduced to twelve grains daily. But this proved insufficient to overcome the strong hold the malaria had on him, for on the 8th he had a chill with a temperature of 105°, and the same happened on the 16th; from the 8th to the 12th the temperature fluctuated between normal and 101°. During the profuse sweating that followed the outbreak of the 16th he became wildly delirious, though the temperature had fallen to 99°, and he remained delirious all night, wakening quite himself in the morning.

By the 20th of the month the patient was sitting up in his clothes; he looked pale and complained of weakness in his legs and of inability to walk without support. Basham's iron mixture was added to his



treatment. On the 23d cramps were noticed about the knees, and he had vertigo. My colleague, Dr. Arthur V. Meigs, who then had the patient in charge, fearing further malarial seizures, increased the quinine to four grains every four hours during the day hours. There was no return of the chills, but by the 24th the weakness of the lower extremities had culminated in complete paralysis; motion and sensation were alike lost, the arms were not affected. Soon, however, they too showed signs of impaired power, though not to a marked degree. The quinine was stopped and iodide of potassium given, which by the 27th had been increased to thirty grains three times daily. An examination of the eyes by Dr. Harlan detected nothing but a slight degree of hypermetropia.

In the next three weeks there was not much change in his condition. It may be thus summed up: He sits up in bed; can use his arms, though the muscular action is not strong; the grip of the hand is impaired, the right more than the left. When the fingers are extended there is marked rhythmical trembling in them; cramps occasionally occur in the muscles of the neck, especially on the right side. There is absolutely no power of motion in the right leg; slight power exists in the left leg, enabling him to lift it a few inches from the bed. Both knee-jerks are exaggerated, particularly the right; there is no ankle-clonus. The nutrition of the muscles is unimpaired; they are firm. The sensation in the legs is completely abolished. There is no rectal or bladder disturbance; the temperature is normal.

The palsy now improved slightly, and he went around the ward on crutches. The iodide produced a marked rash; it was stopped October 22, and arsenic, beginning with three drops of Fowler's solution, was commenced. On the 24th he had a slight chill, followed by fever. There was no change of marked character noted by Dr. Norton Downs, the resident physician, who watched him closely, until November 5, except that the palsy had improved to the point that he could raise the right leg from the floor; he had some difficulty in emptying the bladder, and complained of a gnawing pain in the back in the mid-dorsal region, which was, however, greatly relieved by a blister. The sensory phenomena showed no amelioration. The anæsthesia, both in the legs and arms, especially in the right arm, was decided, and coexisted with marked formication in the legs; there was a zone of anæsthesia encircling the chest about two inches below the nipple; he had almost complete loss of taste. The co-ordination of the muscular movements in the legs was decidedly disordered; his gait was that of an ataxic; he could not stand with his eyes closed, nor walk in the dark. The

muscular response to the faradic current was good ; the pupils reacted normally to light and to accommodation.

On the 5th of November a group of head symptoms was manifest. He had severe occipital headache ; his hearing was found to be affected in a marked degree ; he had decided bitemporal hemianopsia, and his memory was so impaired that he forgot almost instantly a question asked. The appetite was poor ; the urine had a specific gravity of 1020, was acid, contained neither albumin, sugar, nor casts ; he had a light chill followed by slight fever, though he had been taking off and on about six grains of quinine daily for weeks, since the larger doses given in the early part of the case were reduced. From now on until the 14th the cerebral symptoms were very marked. There was intense boring occipital headache with flushed face, complete loss of taste except for sour things, and inability to use the weakened muscles of the jaw for chewing solid food. But the tongue was protruded without difficulty and straightly, the pupils were normal, though the left was noticeably larger than the right ; and nausea without vomiting, anorexia, a firm, rapid pulse, a temperature varying between  $101^{\circ}$  and  $103.4^{\circ}$ ,—the latter in the evening,—urine of specific gravity of 1030 and free from albumin, sweating of the feet and legs, and greater muscular power than previously observed, made up the clinical features of his singular state. Yet more striking than these symptoms were the outbreaks of hallucinations and of maniacal delirium that necessitated his being confined to the bed with straps. They mostly came on at night, though the first one was a morning attack, were only slightly controlled by bromides, but were decidedly influenced by hypodermic injections of one-ninetieth of a grain of hydrobromate of hyoscine, which not only quieted him, but steadied his mind. Between these spells, which occurred irregularly and not frequently, he was rational.

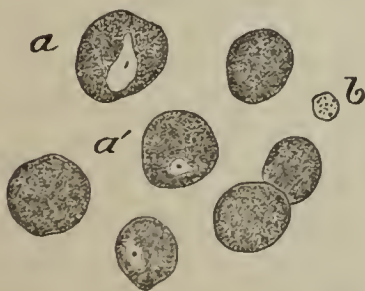
By the 14th, although there was still some evening fever, the patient's condition had greatly improved. The headache was much less ; he could walk with a cane, though the gait was almost a run ; he slept well, and no vesical or rectal disturbance existed. An examination at the eye department, by Dr. Harlan, gave us the particulars of the half vision that had become a marked feature. The patient had complete inability to see on either side ; could only see anything that was directly in front of him,—“like a horse with a big pair of blinders” was his own description. He complained of dimness of sight, but the ophthalmoscopic appearances were absolutely normal. Vision, however, was very much diminished ( $V = \frac{1}{CC}$ ), and existed only in small



nasal fields, which were sharply defined and perfectly symmetrical.<sup>1</sup> On the 18th, following a maniacal outbreak on the afternoon of the 17th of a few hours' duration, he rather suddenly became entirely blind. Prior to the loss of sight he began to see yellow, a few objects, however, appearing black or green. The temperature was normal; he was rational. The yellow vision persisted on the 19th, though he could recognize some colors and see light on the nasal fields, but could not distinguish objects; there was no perception on the temporal sides.

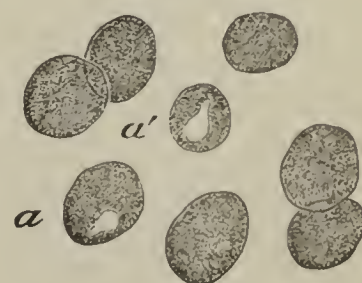
Let me here interrupt the narrative to remind you that at about this time he was brought before the class a paralytic, with the strange history I have given you, and that, dwelling on the irregularity of the symptoms, on the fact that they did not indicate any of the known affections of the brain or spinal cord, and on the history of the case, I pronounced it one of malarial paralysis, and suggested that a close search of the blood be made for malarial germs; a partial examination of the kind had been already attempted, but was not satisfactory. Dr. Joseph Leidy, Jr., kindly undertook the investigation, and with the most decisive results. I show you here the appearances under the microscope as he has drawn them, and you will see how conclusive they are. You will observe the hyaline bodies, pigmented vacuoles, and masses of free pigment in Figs. 1 and 2, and instances of the pigmented bodies, with one in which the hæmoglobin had been entirely

FIG. 1.



*a, a', vacuoles containing pigment; b, pigmented body, outside of corpuscle.*

FIG. 2.



*a, a', hyaline bodies.*

consumed, in Fig. 3. In Fig. 4 you will note a pigmented crescentic body, detected in the case, for the first time, in the examination made just before the clinic. Now, these appearances are all very striking, and closely correspond with what Laveran has described as the characteristic elements found in the blood of persons subject to the malarial poison,—namely, pigmented bodies in the interior of red corpuscles; a pigmented ciliated organism; pigmented crescentic bodies. In our

<sup>1</sup> The ophthalmoscopic details have been published in full, with charts, by Dr. Harlan in the Transactions of the American Ophthalmological Society, vol. v., 1890.

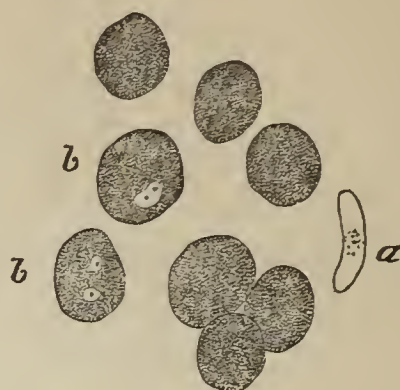
examination we did not encounter the pigmented ciliated bodies; they are, indeed, very much more common during the acute than during the

FIG. 3.



*a, a*, pigmented bodies,—the hæmoglobin is entirely consumed in one corpuscle; *b*, hyaline body.

FIG. 4.



*a*, crescentic body; *b, b*, pigmented vacuoles.

protracted disease. Fig. 4, *a* is not apt to show itself before the later stages, and in the malarial cachexia.

To resume, now, the history of the case. Fully convinced of the malarial origin of all the symptoms, twenty-four grains of quinine were given daily, for the most part four grains at a time. He began at once to improve decidedly, and the improvement, with slight exceptions, continued without drawbacks. One of the exceptions was on the evening of the 18th,—before, therefore, he had completed the second day of the treatment,—when he had one of his attacks of delirium, promptly, however, checked by the hypodermic injection of hydrobromate of hyoscine; another was pain and stiffness at the back of the neck with slight retraction of the head, relieved by ice to the spine. Hearing and sight gradually got better; vision returned first to the nasal fields, extended rapidly to the temporal, and was normal by the 24th. The taste had become natural, and there were now many complaints of the bitter taste of the quinine, which previously was unperceived; he could chew his food well. The sensation all over the body was good, and he walked without marked difficulty. The temperature was mostly normal; though the evening temperature of the 24th is recorded as 100°. There was a great diminution in the number of the malarial corpuscles, yet the vacuole-bodies were always present, and at times the crescentic.

Influenced by the striking improvement, the quinine was reduced to sixteen grains daily; but this proved to have been premature, for on the evening of the 27th the temperature went up to 102°, declining to 100° on the morning of the 28th. Twenty-four grains of quinine daily were resumed, and there were no more interruptions to the steady



and complete convalescence, barring a very slight delirious attack on the night of December 2, yielding, as before, quickly to the hyoscine. Frequent examinations of the blood failed to discover the presence of any of the malarial elements described, with the exception of a few masses of free pigment; on one occasion a single crescentic body was detected. The red corpuscles, which had diminished to 3,390,000, increased in three weeks to 5,100,000; the hæmoglobin was not tested. The quinine was lessened, and the patient left the hospital December 4, fully convalescent and rejoicing in the free use of his limbs.

[The recovery was complete and radical; for a letter to Dr. Leidy from the patient, from San Francisco, written over a year after his discharge from the hospital, speaks of his enjoying perfect health.]

Let us now look at the features of this case of malarial paralysis and notice the peculiarities that characterize the malady. First, let me point out to you the profound malarial impression, which, however, notwithstanding its obstinacy, was far less regular in its manifestations than we commonly find in malaria; the chills occurred irregularly, the fever was irregular in the heights to which it attained, and persisted in an irregular way for days; and we observed later in the case no certain periods in the outbreaks of the extraordinary maniacal attacks. These maniacal outbreaks were, indeed, most peculiar. They happened without warning, and lasted several hours. The delirium was noisy, boisterous, associated with great restlessness, with a disposition to leave the hospital so marked that the patient had to be strapped to the bed to prevent it; there was incessant singing and shouting; the temperature was slightly elevated; the face was flushed. An extraordinary fact connected with the seizures was the way in which the hypodermic injections of hyoscine controlled them. The graver attacks were all modified by them, and the patient awoke rational from his sleep; in the slighter ones the injection soon brought him to his senses.

But the features of the paralysis are, with possibly the exception of the eye-phenomena and of the state of the blood, those on which attention must centre. We find a motor paralysis of the lower limbs, at first complete, and partial paralysis of the arms; no impairment of the rectum, though some of the bladder; good electro-muscular reactions, and, further on, returning power, but gait and symptoms like those of an ataxic, except in the well-preserved knee-jerks and in the pupillary reactions. Throughout the case is seen the prominence of the altered sensation, the great amount of anæsthesia all over the body, the lost sensation being manifest to touch, to pain, and, so far as tested,

to temperature. The special senses, too, are impaired,—taste, hearing, eyesight. Indeed, the sensory phenomena are even much more striking than those of the motor palsy. It is further to be noted that they persisted while the motor palsy gradually yielded. Let me add, with reference to this, that its improvement was irregular; the paralysis returned for a time decidedly after having greatly lessened, yet with the intense development of the cerebral symptoms, it did not retrograde; indeed, it seemed to improve all the more quickly.

It was this transfer of signs of disorder, as it were, from one part of the nervous system to the other, without definite cause, that made me believe in the malarial origin of the symptoms, notwithstanding the long treatment with quinine and with arsenic. I was, too, strongly influenced in my diagnosis by what I dwelt on when I first showed the patient to you, by the great and general anæsthesia, by the motor palsy, markedly lessening while the signs of locomotor ataxia seemed to supersede it, by the recurrence of some of the symptoms after their disappearance; in one word, by the want of continuity in the symptoms. Then, they did not belong to any fixed disease of brain or spinal cord; there were features present and features lacking of more than one affection. Take those which in the latter stages were the most to be thought of, locomotor ataxia and brain tumor. We looked in vain for the violent neuralgic pains of ataxia, for the conditions of the pupils, for the absence of the knee-jerks; and the motor palsy that preceded the staggering gait and disturbance of co-ordination was much too great to belong to the earlier symptoms of ataxia. As regards brain tumor, it must be admitted that the diagnosis was at certain stages very difficult; the hemianopsia so suggestive of this made it especially so, as did the disorders of hearing and of taste and smell, and the violent headaches. But with reference to these, they were not persistent; the perversions of hearing, taste, and smell formed evidently a part of the very general sensory disturbance,—too general to be likely due to a tumor,—and the hemianopsia was unconnected with any signs of optic neuritis or of choking of the disks.

The eye-symptoms of the case were, indeed, remarkable. Dr. Harlan, our ophthalmic surgeon, who examined them minutely, has been unable to find another instance of bitemporal or binasal hemianopsia due to malaria. Instances of bilateral hemianopsia, the result of malaria, have been observed, as well as amblyopia, with or without changes in the fundus. The loss of sight is, however, not nearly so frequent in the poisoning from malaria as it is from uræmia. In the case we have been discussing, the loss of vision was on both sides and



complete, but it was transient. The marked colored vision is also a symptom worthy of note.

But perhaps the greatest interest in the case attaches to the examination of the blood ; it furnishes the positive knowledge, in the light of which we read everything clearly. I shall not repeat what I have told you of the exact appearances we found ; but I shall point out to you how the recent researches of Laveran and those who have followed him may be turned to useful clinical account, and may be employed to advance practical medicine. Doubtless, many a puzzling case will thus be solved, not only of malarial paralysis, but of other obscure forms of disorder of the nervous system caused by malarial poisoning. For we find persistent headaches, convulsions, mental derangement, obstinate neuralgias due to it ; and ataxic symptoms may be developed by it, as we see not only from this case, but know from one recorded by M. H. Bell ;<sup>1</sup> and a form of epilepsy may be owing to it, as the case interestingly described by H. C. Wood<sup>2</sup> teaches.

Malarial paralysis, the manifestations of which I have been endeavoring to explain to you in connection with a striking case, is not a common disease, though it is probably more common, especially in highly malarial districts, than is supposed. It may come on in the acute, well-defined malady ; but what I have seen of it makes me believe that we are to look for it rather in the irregular than in the typical cases of the disease, and that it is the outcome of malarial cachexia quite as often as, or oftener than, of acute outbreaks of malaria. It is difficult to lay down for it any absolutely conclusive rules of diagnosis. But, speaking generally, I shall point, besides the history, to the general character of the paralysis, the great frequency of paraplegia, the extreme rarity of hemiplegia, the intact reflexes, the rapid change and variability in the symptoms, the marked sensory disturbances, the well-preserved faradic electro-muscular contractility, and the finding of the malarial organisms in the blood. The paralysis, too, though variable, does not come and go in paroxysms, as may be inferred from the way it is mostly mentioned. The common belief is that it is strictly periodical. "The characteristic feature of the paralysis is that it is intermittent, and that it occurs at regular intervals, just as the ordinary febrile paroxysms," is the statement made by Bramwell, a distinguished recent authority on diseases of the spinal cord. But I am certain that this is only one form of the malady, and,

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<sup>1</sup> Indian Medical Journal, 1887, vol. vii. p. 341.

<sup>2</sup> Philadelphia Medical Times, 1882, vol. xiii. p. 575.

I think, not the most usual, though it is necessarily the easiest to recognize.

The rarity of hemiplegia has been just alluded to. For myself, I have seen but one case, and that was of a character which separates it from the ordinary instances of malarial hemiplegia. There are, however, cases described, for instance, by Grasset, in which hemiplegia with aphasia existed and passed away under the influence of quinine; and Whittaker<sup>1</sup> narrates the history of a partial hemiplegia in connection with trifacial neuralgia which was distinctly periodic in its recurrence, and in which all the manifestations of the disease yielded rapidly to large doses of quinine. The case to which I alluded as having come under my own observation was one I saw some years ago with Dr. R. J. Levis. It quickly followed remittent fever, great headache and strabismus having been observed during the fever. It was at first strictly a hemiplegia with marked loss of power in the leg, with very little in the arm. There was hyperæsthesia rather than anæsthesia, and well-preserved electro-muscular contractility, sensibility, and good reflexes existed. No periodicity was noticed in the symptoms of paralysis. The boy improved slowly, until, after treatment with a "pneumatic cure" in the hands of a charlatan, the other side became paralyzed; finally convulsions and enlargement of the head supervened. It is very evident that we had here throughout an organic cause for the paralysis, most likely in the first instance a meningitis with exudation; and what I want to explain to you is, that there are cases of hemiplegia, especially, I believe, in remittent fever, which are due to a distinct organic cerebral cause, however brought about by the malarial poison, and are to be separated from the other kinds.

I have thus endeavored to make it clear to you that there are three forms of malarial paralysis to be taken into account. First, the form, which I hold to be most common, of general paralysis or paraplegia with irregular symptoms, of which the case we have been examining has given us a marked illustration. Secondly, the form in which the periodicity is striking, and which is much more apt to show itself as a hemiplegia. Thirdly, the rarest form, that in which actual organic disease is produced by the malarial poison, and in which periodicity and variability are not prominent, the case running much the course of ordinary paralysis when produced by its usual causes. This kind of palsy in malaria, commonly due to a brain-lesion, such as meningitis or apoplexy, shows itself most often in the shape of a hemiplegia.

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<sup>1</sup> Cincinnati Lancet-Clinic, April 9, 1887.



It is true that it is not, strictly speaking, a malarial palsy, though a malarial fever has brought it about; it is rather palsy in malarial disease.

The cases of malarial paralysis that are periodical, in which the palsy comes quickly, disappears, and returns, must be distinguished from cases of intermittent paralysis that have been described by Westphal, Hartwig, and Cousot,<sup>1</sup> which are evidently not malarial. It may be very difficult to distinguish such an affection, which in truth has been noted even in malarial subjects. Generally, however, we can obtain no history of malaria; often there is the fact of several cases having happened in the same family; the special senses and the general sensibility are not affected; very great diminution or even abolition of electric excitability without reaction of degeneration is met with; the attacks are irregular, may come on for years, and are not permanently influenced by quinine. We find thus that periodicity is not a strictly characteristic sign of malarial paralysis; since here we have a palsy which is periodical and intermittent, but not malarial. It would be interesting and, I believe, valuable to examine the blood in cases of the kind.

The prognosis of malarial palsy is favorable; it is certainly so when the disorder is treated early and decidedly. Excluding the third group I have mentioned, which, as I have already said, is not really a toxic or malarial paralysis, we may expect recovery. I have seen this take place (as in a sailor in this hospital some years ago with complete paraplegia of malarial origin) even where the loss of power existed for a considerable time. Yet, if the affection have lasted long and have had no active treatment, secondary changes may be set up leading to serious organic changes. This is especially the case in the spinal cord; for poliomyelitis and various sclerosis may follow. You will find in Morton Prince's article useful information bearing on the subject.<sup>2</sup>

As regards the cause of malarial palsies, we cannot speak with certainty. An accumulation of pigment, with the capillary embolism it may produce in brain, in spinal cord, or in organs of special sense as the cause, is a theory only qualifiedly admitted by Frerichs, and denied by Charcot, and is not tenable when we take into account the rapid change in the symptoms, as well as their recurrence, and the prompt recovery that may happen. There is, in truth, much doubt about these capillary pigmentary apoplexies. None were found in the elaborate

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<sup>1</sup> *Revue de Médecine*, No. 7, 1887.

<sup>2</sup> *Medical News*, July, 1889.

researches in this hospital<sup>1</sup> made by my late eminent colleague John F. Meigs. To me it seems very likely that the malarial germs carried about in the blood may have a direct action on special nerve-centres; not a mechanical one, but one such as several vegetable poisons possess, or as the poison of diphtheria exerts. The destruction of the malarial germs or their rapid augmentation would account for the great and sudden changes that may be seen in the cerebral or the spinal phenomena, including the outbreaks of wild delirium.

In the treatment of these malarial palsies we witness marvellous effects from large doses of quinine. I say advisedly large doses; for the malady will go on unchecked by small doses,—nay, may develop rapidly while these, or even while what are generally quite sufficient doses, are being employed. This was clearly shown in the case we have been examining. Quinine, given at first in large doses, was for a time replaced by smaller ones, when the doubtful nervous symptoms appeared. Large doses of iodide of potassium were administered; the patient grew worse. Arsenic for a time was beneficial. But it was only when quinine was again given continuously in large doses, and the small ones, which the patient had indeed rarely entirely abandoned, were wholly discontinued, that the rapid and striking change leading to recovery took place; eye-symptoms, brain-symptoms, all disorder, seemed to melt away under the potency of the drug.

In the record of the patient we have been examining, there is a further point to which I wish to call attention,—the rapid lessening and the quick disappearance from the blood of the micro-organisms, coincident with the obvious amelioration, under the decided doses of quinine. This was studied several times daily, and in a few days the change was extraordinary. We have in this observation a fact which must interest every therapist, and which, it is to be hoped, will prove an addition to positive knowledge.

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<sup>1</sup> Pennsylvania Hospital Reports, vol. i.



**MYSOPHOBIA (GRÜBELSUCHT; ZWANGSVOR-  
STELLUNGEN; FOLIE DU DOUTE;  
FOLIE DU TOUCHER).**

CLINICAL LECTURE DELIVERED AT LONG ISLAND COLLEGE HOSPITAL MEDICAL  
SCHOOL.

BY JOHN C. SHAW, M.D.,

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UNDER the above name I ask your attention to a mental disturb-  
ance which is seen almost exclusively in private practice.

The name mysophobia (fear of contamination) was suggested and  
used by Dr. William A. Hammond, in 1879, to designate a peculiar  
mental disorder which he had observed. Under the same title Seguin,  
in 1880, reported a case of the disease. Russel reported another case  
in 1881, and in the same year I reported a similar case. In 1883,  
Tamburini reported an excellently studied case.

The name mysophobia well indicates a prominent clinical feature  
in these cases, and is quite applicable so far as this particular form of  
the disease is concerned. But as this condition is, in my opinion,  
nothing more or less than one of the clinical forms of a large group  
of psychic disturbances which have been well studied and described by  
Griesinger, Westphal, Berger, Krafft-Ebing, Shule, Wille, Emming-  
haus, etc., in Germany, and by Legrand, Du Saulle, and others, in  
France, under some of the titles given above, a brief description of  
this condition in general may well precede a description of one of the  
most curious of its forms. It is characterized by forced ideas or im-  
perative conceptions, a certain amount of moral depression, and a  
weakening of the will-power. It is almost always an evidence of an  
hereditarily transmitted neuropathic constitution. It is, perhaps, ob-  
served in its simplest form in certain neurasthenics, in which it may  
exist for a few days or for several months. It is caused in these cases  
by a disturbance in the general organism, such as disorders of men-

struation, hemorrhages, etc., but most commonly by gastro-intestinal disorders. These persons may show this disturbed psychic state in a fear that they will fall or faint if they go into the street. The moment they leave the house this idea comes upon them, they become agitated, their legs become weak, cold perspiration comes upon them, and they are completely demoralized until they reach the house again. In others it assumes the form of multitudinous fears and dread as to their own health. They are not satisfied with the assurances of their physician. These fears constantly recur, and they have to send for their physician again and again to reassure them. They repeat the same doubts and fears to him over and over again, and ask the same questions. They think this medicine is not good for them. They doubt if they have been taking the proper treatment; they reason and question their physicians on all these subjects, and are never satisfied. They remain still in doubt and never come to any decision. This constant reasoning, questioning, and doubting soon leads to a perplexed, agonized state of mind, and if it is sufficiently intense headache, palpitation, and agitation may ensue.

In the more prominent and well-defined cases it is characterized by a sudden and involuntary appearance in the train of ideas of "thoughts" or words entirely unconnected with the then existing flow of ideas. These thoughts take possession of the consciousness and force themselves upon the attention of the person. They confuse and surprise him by their presence, and he cannot explain them. There are many varieties of this disordered mental state. In the simplest there is no disturbance of consciousness. The sufferers from it are usually of considerable intelligence, are quite rational, can reflect correctly upon their state, and can recognize the absurdity of their ideas and try to overcome them.

In another group the "thoughts" or words are connected with the strange ideas of the person, which take possession of them, and are constantly recurring. With these imperative conceptions they are often compelled to perform certain acts which they know to be absurd, like the arranging of articles in a certain position, or the performance of some trivial act brings on an imperative idea. Thus, after spitting on the floor, the idea at once arises that he has spit on God. He must pray for forgiveness, and this compels him to pray wherever and whenever the idea may arise.

These imperative ideas may arise on the sight of some objects. In one person the sight of knives brings an imperative idea to kill her mother; the sight of persons passing in the street, an imperative de-



sire to know their names, and, not knowing them or being able to find them out, a state of agitation and bewilderment follows. Or in another the sight of fruit brings an imperative desire to obtain fruit not in season. Or it may take the so-called metaphysical form, in which the person is always questioning and reasoning. Who is God? Who am I? What am I doing on the earth? Am I living? These strange questionings and doubts are constantly recurring, and no solution is reached, and the person finds it hard to think of anything else. Or it may be an imperative idea that he cannot cross an open space or a river (agoraphobia). Or that he cannot ride on a steam-car. One of my patients who had this dread idea told me that as soon as he was on the train the thought came into his mind that he could not get back again if he went so far away from home. He is a very intelligent man, and knew the absurdity of such an idea, but he could not resist it. He was at once, under these circumstances, thrown into a paroxysm of terror, in which he crouched down into the corner of his seat, trembled, cold profuse perspiration broke out upon him, he had palpitation, and felt compelled to rush from the train to relieve his agony. If the cars had started and he could not get off, he had recurrences of these paroxysms so long as he remained on the train. In speaking of this condition he always said "he became panicky."

The true kleptomaniaes, the dipsomaniaes, and the cases of perverted sexual instincts belong to this group. I might spend a much longer time than is at our disposal, and quote such cases from my personal experience; but this must suffice as an introduction to the consideration of a special variety.

Four well-marked cases that can be classed under mysophobia have come under my observation; in all of them, the fear of contamination was the most prominent feature.

CASE I.—E. I., male, aged fifteen. For months previous to my seeing him, his mother had observed that he was very particular about washing his hands clean, which, she observes, "is quite unusual for boys to do." About six months ago there occurred the first decided symptoms observed by her. He said to her one day, "I have been touching the paint; do you think it could come off the wall and poison me?" Soon after he began to present other strange actions and remarks. He would not take off his own hat, but ask her to do it for him; he would also request her to unbutton his coat. He would not use his night-key to come in at the front door, but knock on the door with his elbow. He is afraid that if he touches anything with his hands it will poison him. He is very particular to wash his hands.

He spat on the carpet a few days ago, then rubbed it off with his shoe. He immediately came to his mother and asked if she thought he could have got any of the color off the carpet so as to poison him. He would go about holding his arms and hands away from his body, as if he were afraid of touching his clothes. When he goes to bed at night he will wash his hands a dozen times, and use as many towels ; if prevented from doing this he appears distressed, and will sometimes under these circumstances rush over to the water-pitcher and thrust his hands into it, which appears to satisfy him.

His mother thinks that of late he has presented a vacant, idiotic facial expression that he never had before. When the boy is talked to he speaks sensibly, but will give no explanation of his fear of being poisoned by touching objects about him. He complains of frontal headache at times, especially when he goes to school ; for the past two weeks he has not gone to school, and has not had the headache. He looks dull and apathetic. He has a decided neurotic family history ; the father and brother of his mother suffer from some nervous disorder, but no definite account of the condition can be obtained.

This patient was seen but once.

CASE II.—Male, aged seventeen. The only child. His mother gives no very definite previous history. The boy learned well. After leaving school he was engaged in an office in New York. His mother first noticed, several months prior to bringing him to me, that he was dull, took no interest in his home or surroundings or in his business ; he was constantly washing his hands ; he had a dread of touching things about the house, thought they were dirty ; would not eat his meals, but gave no reason for not eating, when his food was left in his room ; after going without a few meals he would eat ; he most probably thought the food was not clean.

Soon he began to have an imperative impulse to kill his mother ; it was never learned whether this occurred when he saw knives, or only when he saw his mother. This impulse to kill her came on in paroxysms ; fully appreciating the enormity of such an act, he was at these times very much terrified and in great agony, trying to resist this morbid impulse ; he would crouch down in the corner of a room with a distressed, agonized facial expression. In this agony he would beg his mother to tie him, fearing he might lose control of himself and kill her. If she left him and locked the door he was satisfied and relieved. He became thin and pale, and his appetite poor.

He still washes his hands, but not so continuously ; this last morbid impulse appeared to have thrown the others into the shade. After



many months of distress from this morbid idea to kill his mother, a gradual subsidence of the imperativeness of the idea took place, and it was finally overcome. During all this time he frequently said if he could move out of the house he would be better; to his mind the morbid feelings were connected with the things in the house. He has since recovered from this abnormal state sufficiently to again engage in a business; but as to his exact mental condition at the present time I have no knowledge, as I have not seen him for a long time. There is insanity on his father's side, but the mother either did not know or would not say what members of the father's family were or had been insane.

CASE III.—A boy, aged seven years, seen in consultation. He has developed well so far; is stout and of healthy appearance; is exceedingly uncontrollable, will not do what his parents wish him to do, and if an effort is made to control him, he screams and kicks. He is, consequently, allowed to have his own way. The parents are intelligent people. The mother is a healthy, sensible woman. The father is a large man, well-informed, and successful in business; but morbid, and suffers from some peculiar ideas, as I learn from his family physician. He is unwilling to give any information about his ancestors. He has on several occasions come to his family physician and told him that he did not think their last child was his,—some other man must be its father; and yet he has no fixed delusions that his wife is unfaithful. On another occasion he stated to his physician that he wished some operation done on his penis, as it was not the right shape; it was crooked and not useful. He made a drawing to show the shape of the penis, and another to show how he wished it to be. Otherwise he is quite sensible and rational.

The little boy, his son, only seven years old, recently surprised his parents one day by telling them that the knives were dirty, and refusing to eat anything that was cut with them. Soon he would not eat anything, fearing it was cut with a knife. Everything that he ate had to be broken with the hand. He soon began to say that the food was dirty, and would be an entire day without eating anything, and at night eat upon the persuasion and assurance of his mother that the food was clean, as she had prepared it herself. In a short time he expressed the idea that it was not alone dirty, but poisoned; refused more persistently to eat, began to be afraid to touch things about the house, but did not single out any particular object; would suddenly stop in his play and talk about having touched something that would poison him, or would maintain that touching some of the persons in the room would have

this effect. At this time he began to talk about "blood-poisoning," saying that if he touched anything it would cause "blood-poisoning." These statements and remarks were made at intervals only, and at other times he would play about the room with his toys, laugh, and be quite natural. This clearly shows that the ideas must have arisen from time to time as imperative conceptions; though his idea about the knives was persistent. It is strange that a child of his age should talk about blood-poisoning. For entire days he would go without food, eating a little only at night upon the persuasion of his mother. This he had done for a week before I saw him, and there was some fear that he would starve himself. When an attempt was made to talk with him and examine him, he screamed and kicked so violently that nothing could be done.

CASE IV.—In this case I can trace out with considerable minuteness the various steps in this curious mental disturbance, which I have been unable to do so well in the previous cases, owing partly to the great reluctance of the parents to give the information asked, and partly to the inability of the patients to describe their feelings and ideas.

Male, aged nineteen. The parents of this young man are unusually intelligent, well-educated, and refined persons. He is the only child. The father's side of the family are free from nervous disorder. The mother gives no information about her family except herself. When a very young child, under eleven years of age, she was very nervous, and had the idea that if her mother left the room or house she could not breathe; the result was that when her mother did leave her she would stop breathing and fall to the floor unconscious. This occurred so constantly that her mother was obliged to remain continually with her. At eleven years of age she had ceased to have this idea, but another took its place. She began to think, "How is it that people can swallow without choking," and, not being able to explain it to herself, she thought that when they swallowed they would choke. Thereupon, every time she swallowed she choked (the metaphysical or philosophical form of *folie du doute*). This condition continued for some time, then passed away. Since that time she has never had any ideas of the kind, and has had no nervous disorder. Her son was born after a natural pregnancy and labor. From his birth he was an exceedingly irritable, cross, sleepless baby. He cried almost constantly. If he were asleep, the least sound in the room would awake him. At this early age he would not go to sleep until twelve o'clock at night, and awake again at four o'clock in the morning. He would keep awake all the rest of the time, and cry most of it. At sixteen months old he had whooping-cough



and convulsions. Every day for a week he had one or two convulsions, and exceptionally he had as many as five in one day. Whenever he was put to bed at night and he began to cough, he always had a convulsion; as soon as the whooping-cough ceased, he had no more convulsions. He never would eat any solid food until he was three and a half years old, but lived on condensed milk. He was at this time quite fat.

One day he had a "bilious spell," vomited, and from this time he abandoned the eating of condensed milk. He was at the house of a near relative on this day, and, happening to go into the kitchen, saw there a raw beefsteak, and, to their surprise, asked for some of it. It was given him, not thinking he would eat it, but he did,—the first solid food he had ever eaten. For some time after this he always ate his meat raw. As a child he was variable in his appetite, would hardly ever eat at the table, but only between meal-times, and ate bread principally. He never asked for sugar and sweets, as other children do, but wanted salt. As he grew up he learned very quickly, and took an interest in any subject they spoke to him about.

When ten years old he had an attack of chorea of considerable severity. When twelve years old he went to one of the well-known private schools of the city, where he learned rapidly, showing great aptitude, especially for mathematics. At seventeen years of age he left school, although his parents were anxious that he should continue his studies and enter one of the universities, and tried to persuade him to do so. He entered a coffee business which was kept by a friend of his parents. He remained in this position only two months. During this time his employer had observed that he washed his hands very frequently. When he spoke to him about it he received the answer that his hands felt sticky and dirty.

For several months his father had found it necessary to scold him because he did not get to bed earlier. He would go to his room at an early hour, but his light would be found burning until very late. His parents thought he was simply indolent. This was during the time he was in the coffee business. After he left the business his mother observed, for the first time, that he washed his hands very often. One day she saw him washing his hands a number of times in rather rapid succession. She asked him why he had washed his hands four times in such a short space of time without his having touched any objects. He repeated, "Oh, I do not know," and appeared very much annoyed at being questioned. This desire to wash his hands continued to become more imperative until about December of 1889 and January,

1890, when he would sit up very late at night and be very late coming down to his breakfast in the morning. At this time his mother observed that he would sprinkle his sheets and night-clothes with water, roll them up, and unroll them again ; he spent a great deal of time in the morning and at night performing these strange acts. One day, seeing him winding and unwinding the bed-clothes and night-clothes, she asked him if she could not do some of this work for him. He allowed her to do so, telling her she must crumple up his night-shirt eleven times and pull it out again before he could put it on. He also wished the sheets to be rolled and crumpled up eleven times before he could go to bed. When he arose in the morning he had to do the same before he could begin to dress. He laid great stress upon rolling these clothes *eleven* times. At this time there were undoubtedly other imperative acts which he performed unscen by his parents. He still washed his hands a great deal. It was the performance of these acts which kept him up so late at night and in his room until ten or twelve o'clock in the morning. At this time he showed very evident dread of touching the objects in the house. When he came down stairs his attitude was peculiar : he always bent his body over to one side, with both his arms extended out to that side, his head bent to the same side and a little forward ; the direction in which his body was bent was always away from the wall and towards the hand-rail of the stair-case. If he thought any part of his clothing touched the banister, then he would move slightly away from that ; his facial expression was distressed and anxious. He would not any longer carry his night-key, but knocked on the glass of the front door with his hands when he wished to come in. If his parents touched any of the furniture in the dining-room he would not go near it again. In this way he gradually abandoned sitting on the chairs in the dining-room, one after the other, until, at last, there was but one which he would occupy. One day he thought his mother had sat on it, after that, when in the dining-room, he would stand, making every effort not to come in contact with the objects in the room or its walls. He thought the chairs were dirty. He never refused to eat or showed any dread of knives.

He was afraid of all the doors in the house, especially that of the bath-room, and dreaded touching them. He had a special dread of all the door-knobs. He often asked his parents to move out of the house. He had a dread of people's hats and heads, thought they would soil or contaminate him, and had a similar idea about his own hat. He would often say to his mother suddenly, when she was not near him, "Did your head touch mine?" He would be very much



distressed at the idea that her head had touched his, and yet his own senses told him that it had not. If she assured him very positively that she had not touched him, his anxiety was relieved and he appeared satisfied. During this time he was quite unwilling to speak of his condition. He told me that he was compelled to arrange and rearrange his clothes and other things in his room; he did not know why. It troubled him most when he was in his room, and took him such a long time that he could not get to bed until about twelve or one o'clock at night, and he had to perform the same acts in the morning.

After about four months of this intense and distressing mental state an improvement began, which has been steady and gradual up to this time. More recently I have learned from him that his trouble began in this manner: when engaged in the coffee business there was more or less dirt and dust about the store, which made his hands often dirty and necessitated his washing them. Soon he began to think they were not washed properly (*folie du doute*), and he had to wash them again, then he thought they felt sticky, and the washing had to be repeated from time to time, as the idea constantly recurred, and he was never satisfied unless he washed. At this same time, and soon after he began to wash his hands, he also had an idea that he must arrange certain things in the store in a particular position (*Zwangsvorstellungen*), and when he had done so, he always doubted his having put them in the right position, and had to return to see if he had performed the act properly (*folie du doute*), but when he saw the objects he was not satisfied, but had to rearrange them.

At the present time his condition is very much improved. He is engaged in a business which requires his attention. He is cheerful compared to what he had been, and he can enjoy himself with his friends. But he still has a dread of people's heads and hats; he does not like to have any one hang a hat on the back of his office-chair, and he always carries his own hat in a peculiar manner, between the thumb and index finger, and held away from him. He also still has a dislike to touch the door-knobs in his house, or the door of his bathroom, but this is confined to his own house.

From a study of these cases we find the fear of contamination a prominent feature in all; washing the hands is common to all. The fear of door-knobs, doors, and other pieces of furniture is found in three of them; the dread of knives, as soiled, in one case. That the food is dirty or will injure them exists in two of the cases.

The dull, stupid, mental state, undoubtedly due to the almost entire occupation of consciousness and attention with these frequently-recur-

ring morbid ideas, existed in three of the cases. The desire to wash the hands and to perform other imperative acts, in obedience to the imperative conceptions, is greater when the person is alone. He abandons himself entirely to these imperative ideas, and ordinarily if he attempts by an effort of the will to put them aside, owing to the impairment of the will-power, he is unable to do so. This struggle distresses and confuses him. It is easier to obey the mandates of the imperative conception, although in doing so he knows that it is foolish and weak; he would give all he had to be relieved of his distressing state.

There was a peculiar way of holding the hands and arms away from the body in two of the cases.

The four cases are all in young people with a strong neuropathic or psychopathic inheritance. In two cases the transmission was on the paternal side, in two cases on the maternal side. They are all males.

A study of these cases, the last case especially, shows clearly that the so-called mysophobia is a perfectly justifiable name for this group of cases, in which the washing of hands and the fear of dirt, etc., is a prominent symptom, but so far only; just as agoraphobia is used to indicate a fear of open spaces, etc. All these cases are but one large class, in which the abnormal mental state consists in the imperative conceptions and *folie du doute*.

In Case IV. the need to wash the hands first led to a doubt as to their being washed clean, and consequent rewashing them. Almost simultaneously we have the imperative conception that certain articles must be placed in a particular position. So that we have the *Zwangsvorstellung*, the *folie du doute*, and the mysophobia all in one case. In Case IV. is a clear account in the mother of the *folie du doute*, or *Grübelsucht*, *Fragersucht* of the Germans.

The prognosis in these cases is not the most favorable; in the milder cases the probabilities of recovery are best. This is referring entirely to the form under special consideration. It is quite possible for these persons to recover, but recovery is slow, lasting six months or a year; or the mental condition may become still more disturbed and permanent insanity ensue. In the event of recovery relapses are to be feared.

**Treatment.**—This must consist in correcting any gastric disturbance which may exist, and in restricting the diet to such food as can be easily digested and is nutritious. As a rule, the patients should take no stimulant, for, although it may cause them to feel better for the time, it is harmful if continued. If these persons are adults, I always



prohibit beer of all kinds : most of them have sensitive digestive apparatus. The beer is apt to ferment before it is absorbed, irritates the stomach, and increases the already disturbed nervous condition. In one of my patients, who suffers from imperative conceptions at times in a very distressing form, the taking of a glass or two of beer at night will make him sleepless, restless, "notional," and bring on his imperative ideas. Under these circumstances he is sure to consult me the next day. The medicinal treatment should be tonic; quinine and nux vomica in moderate doses, two grains of the one and one-eighth or one-quarter of a grain of the other; arsenious acid in the one-sixtieth or one-hundredth of a grain may be added, and such a pill or capsule taken three times a day an hour and a half after meals. If the bowels are constipated, compound licorice powder will be found efficacious. I prefer arsenic in these cases to any preparation of iron. If the digestion be imperfect, essence of pepsin can be given after meals. If the distress and agony be very great, morphine may be given,—either by the mouth or hypodermically. It is, however, better to give it by the mouth three times a day in doses of one-eighth or one-quarter of a grain. It is best to begin with small doses, say one-tenth or even one-sixteenth of a grain, and increase them, as in this way nausea is avoided. This will give the best results if the patient be anæmic and in poor physical health. The morphine should be continued so long only as there is decided anxiety and distress; and be very particular that the patient—or friends, for that matter—should not know that morphine is being used; you will thus avoid the possibility of the morphine habit.

If the patient happens to be florid (which they usually are not) and in good physical condition, the temporary use of sodium bromide may be most serviceable to diminish the distress, giving twenty-grain doses, or even larger ones, three times a day between meals and diluted in plenty of water.

Cod-liver oil, maltine, pepsin, and pancreatin are of great service in those cases where the nutrition is poor and not enough food is taken.

These patients should be out of doors a great deal. If engaged at any confining business, like office or store-work, they should abandon it, and find some occupation which will keep them in the open air and give considerable exercise. If the occupation be one that the person does almost automatically, such as copying, etc., it should be abandoned for one which requires exercise of the attention to perform it,—where constant and somewhat varied thought about the work is required. This keeps the patient's attention constantly outside of his

own thoughts; it gives a kind of mental exercise which is beneficial and strengthening. If he can read, he should do so, in order to keep his attention fixed upon some subject as continuously as possible. He should be in the presence of strangers during as much of the time as he can, when not occupied in other ways. Such patients often are benefited by being away from their own homes,—in the house of friends, where there are new and varied scenes, and an effort is made by the friends to entertain them, at the same time without tiring them. In the case of women, sewing should never be taken up as a means of occupying the attention. As they grow stronger, mentally and physically, they find it easier to dismiss the morbid ideas by occupying themselves with some subject that interests them. In choosing a subject as an occupation in these cases, endeavor, if possible, to learn if there is some one for which the patient has shown a special interest, for such a one will be most likely to accomplish the purpose and hold the attention.



## PERMANENT HEADACHES.

CLINICAL LECTURE DELIVERED AT THE INFIRMARY FOR NERVOUS DISEASES.

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I MEAN by permanent headaches such as last for years, and are rarely, if ever, absent. These are not very common, but several times every winter I see patients who are never without headache. One tells me, "I am conscious of pain whenever I attend to it, and at times it forces me to feel, and is too severe to be forgotten;" another says, "I am never free from pain. I can at times forget it, and that is all."

Very rarely the pain is steadily incapacitating. On the other hand, I know one of these sufferers who is a scholar of great distinction, and who has been also a successful man of affairs, alike public and private. He never knew what it was to be free from pain from childhood, and until he was more than fifty years old; then it got well by degrees. All this, as I reflect, seems to me extremely curious. For what other part of the body is capable of suffering constant pain so long without expressing it in such shapes as at last to exhibit organic change or impaired function? I knew of a clergyman who, for eleven years, had headache which was sufficient to give to his face an expression of suffering, and yet, during all of this time, he wrote sermons of unquestioned ability and attended to the wants of a considerable parish. Whatever, then, be the cause of these nearly constant aches, it may be of such a nature as distinctly not to enfeeble the brain.

The object of this lecture is to sum up a few of these cases which have obvious causes, to point out their difficulties, and to show as to some others at least to what they are not due. A certain proportion of permanent headaches can with ease be traced to well-known influences, but the most enduring of this class remain for me to-day as complete puzzles as they were twenty years ago. In looking back over the note-books of many years, I was surprised to see how many are the

records of headaches lasting for months or years. But upon trying to classify them for consideration here, I soon found that there was a residuum of inexplicable cases.

The headaches I call permanent may be due, as I have said, to a variety of causes. They may coexist with headaches of other and less mysterious types; and this it is of moment clearly to apprehend, so that some illustration of this fact may well precede consideration of the analysis of the causes of this exasperating malady. When we have a headache to study, we bear in mind that it may be due to general causes, as to defects of blood, gout, rheumatism, toxic states, albuminuria or diabetes, malaria, syphilis, functional inefficiency of stomach, bowels, or liver; or, again, that it may be the offspring of fevers or sun-stroke, and is then probably inflammatory; or that this latter type may arise slowly and mysteriously, or, finally, that it may be due to trauma.

Defective eyes may also be the parent, or reflex influences from diseased ear or teeth be at work, or, finally, congestion or troubles in the sinuses of the nose may be to blame; and then at last there are the varieties of neuralgic headaches usually assignable to no obvious cause. Among all these we are to look for the cause of permanent, as well as of inconstant, headaches, if we are to find a cause at all.

A man may be subject to two, or even three, kinds of headache. A patient with a permanent vertex headache may thus be cured of an occipital ache due to eye-strain, and continue to suffer the more constant parietal pain. People get to recognize this fact and describe to you varied forms of headache. The fact that two causes for cephalalgia may exist is apt to deceive. A patient comes to you with violent frontal aches, and with occipital pain. He has compound astigmatism, and, perhaps, inefficient eye-muscles. Sure of your diagnosis, you have him glassed and predict a cure. The occipital pain leaves him by degrees, and the vertex or frontal pain is unchanged. Was it also due to eye-strain? That is not always easy to say. Some oculists think that if you glass a man with an approach to accuracy, you have done all that is possible for the optical aspects of the case. Without going too deeply into the reasons for my belief, I wish to remark that nothing save an experiment with glasses on the individual patient will tell us precisely how he ought to be glassed,—that is to say, with what approach to accuracy.

There are sufferers from headaches due to defective eyes who cannot endure very exact correction without increase of pain; there are



others who find full relief only when the correction is very accurate.<sup>1</sup> There is always an unknown quantity in our therapeutic equation, even when we deal with the optics of the eye, which, theoretically, should be near to perfection. I but mention this matter here because my limits exclude any long methodical consideration of the aches of eye-strain.

Since first I called the attention of the profession to the cerebral results of eye-strain in 1874 (*Medical and Surgical Reporter*) I have rarely seen very constant headaches due to this cause. The intracranial distress from eye-strain comes and goes, and if the trouble is typically hemicranial it is not apt to be caused, even if it may be intensified, by defective eyes. I have sometimes, however, had a clinical suspicion that *it is possible for imperfect eyes, long used to excess without correction*, to give rise to a condition of occipital headache, which may be called permanent in the sense that it continues for years to survive the cause. What I might call a diagram of a case will help us to understand this sequence. A young girl between thirteen and sixteen, ambitious to excel, works her brain through too many hours daily and through her "menstrual Sabbaths." As a consequence, she has a variety of intracranial symptoms, especially occipital pain. After years of such folly, the pain having become constant, some one discovers that she has muscular insufficiencies and perhaps other defects. The muscles are cut, or prisms are used. The right thing is done, we will say; but, nevertheless, no matter how well we may have corrected the eyes, the pain remains. This is not an uncommon story. What has happened to make this headache or distress in the occiput permanent? Usually the physician concludes that the eyes, however much out of order, were really not to blame, and yet as to this he may be more or less wrong. The mischief has lasted long enough to leave in the brain-tissues some lasting result of a too-protracted strain, and we have, as a consequence, either permanent or very frequent headache. To insure these lasting consequences, the evil must have been at its height during the formative period. The brain in its completed growth (if ever it be incapable of normal change) is certainly more enduring of strain, and is, after adolescence, less capable of being permanently damaged by eye-strain. Of the nature of the evil thus brought about by the use or abuse of imperfect eyes, we know nothing. My guess would be that the centres affected are left either in a congested state or with a

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<sup>1</sup> This is especially true of vertigo from eye-troubles: in some cases nothing but the most perfect correction is of use.

capacity to become congested by use, even reasonable use. At all events, permanent occipital distress from long eye-strain is apt to be accompanied by symptoms which indicate an excess of blood in the organ affected. By and by I shall say something of the treatment of this residual malady. Here I wish only to insist that permanent headache may result from bad eyes, that the best correction does not always cure it at once, and that there are headaches, the conjoint product of ill health and eye-strain, which are practically incurable. I would like to prove this by a single brief relation of a case.

I. C., aged thirty-five, an active clergyman, single, has permanent occipital pain, with occasional increase and addition of general headache. The trouble dates from puberty and seminal emissions, with general failure of health. Despite this, he studied hard, acquired intense headaches with vertigo, gave up brain-work, got well; read hard and renewed the pain, and at last, after many reliefs by rest from work, acquired a persistent occipital ache. After a time, with gain in vigor, he entered the church, and, accepting his pain as almost a normal part of his life, continued to attend to his work. A few years ago I discovered his ocular defects. He was glassed with care, over and over, and every attention given to his health, which was never fairly good. Nevertheless, he continued to suffer, and is no better off after years of perfect correction. All continuous use of the eyes adds to his pain. I still think that there was a permanent evil wrought in his brain from ignorant use of eyes which were utterly unfit for work without glasses. I could, at need, supplement his case by others as significant.

Meningitis is a cause of permanent headaches not easily overlooked, when the acute lapses into the chronic form, but sometimes, arising insidiously without specific or apprehended cause, it is not credited with the parentage of headache.

Among my cases are three of prolonged headache due to sunstroke, and in these, as Wood and I have elsewhere shown, the sequent cause is meningitis of a chronic character. These inflammatory cephalalgias are often distressing, the pain being constant, with occasional exacerbations, when the face is flushed. The head throbs, and light, sound, and heat (especially sun heat) are unendurable. All this may arise without apparent cause. One case I knew, which lasted many years, in a busy, useful, middle-aged woman. After much and very constant suffering, she died rather abruptly with signs of pressure, and on examination we found evidences of old and chronic inflammation of the meninges. I have little doubt that some persistent vertex and parietal headaches, not of neuralgic type, are due to local patches of inflammation.



Trauma may also be responsible. A slight injury causes in the young hyperostosis; the bone remains somewhat thickened, with no marked depression, but there is a limited area of adhesions of the dura without clear evidences of present inflammation. These conditions may give rise to nearly constant pain, great sensitiveness of head, incapacity for study, and frequent unendurable additions to the permanent distress. I have seen all this in at least three cases.

In such instances there is more or less adhesion of the dural surfaces, and as these no longer play smoothly over one another, the normal movements of the brain are restrained, so that possibly headaches may, under these circumstances, represent for us in the cranium just what painful stitches in the side do in the presence of old pleural adhesions. Probably, too, the dural nerves, or all the meningeal nerves lying amidst these old inflammatory products, may themselves suffer directly, as well as indirectly, and so these old headaches merely be significant of neuritis of the related branches of the fifth nerve. It will be worth while to learn if this be so.

Very persistent headaches may be caused by the toxic influences of renal disease, but, as a rule, uræmic headache is inconstant. This is not the rule in some instances of diabetes mellitus. I repeat, "in some instances," for headache is not always present in this disease.

A very interesting example of absolutely continuous headache belonged to one of a family in which two brothers and the father all died of diabetes in middle life. The remaining brother consulted me on account of incessant headache occupying generally the parietal and frontal regions, but at times intense also in the occiput. He had very bad eyes and a high degree of myopia with astigmatism. Naturally, use of the eyes gave rise to occipital pain, or increased all the pain, so that this obvious cause in the eyes came to be blamed for all of his trouble, especially as his general health was as yet unimpaired. Glasses failed to aid him. Then the oculist discovered that he had a certain amount of muscular inefficiency, and confidently predicted relief from prisms or an operation. Nevertheless, the headaches grew worse. When I saw him he had twelve to eighteen grains of sugar to the ounce in the morning urine, and it seemed to me that I had discovered the cause of the headaches. It happened that his water had been examined before, but only the night urine, and in this, until later in the case, there was never more than a trace of sugar. Every form of treatment failed to relieve him until I used a diet of skimmed milk. Under this he lost his headaches with all trace of sugar in the urine, but it was never possible to add to his diet even meat alone without

causing a return of sugar to the urine. After a number of efforts he continued to live on milk alone, and did so for seven years of an active business life. For some reason the eyes ceased to annoy him whilst he took only this simple diet, and this also is an experience I have had more than once, for milk diet has in some people a singular power to lessen the irritability of parts, as of the bladder, for example. In other terms, whilst in health, or at least free from glycosuria, he was able to bear unhurt the strain the eyes must have caused, for he was soon able to lay aside his glasses without feeling their loss.

It seems quite certain that asthenic people, especially if anæmic, may become subject to very lasting headaches, which are always present in less or great degree. These are dull aches of a part or of the whole of the head, and affect, too, the upper spine, and of course at times become severe. I have now such a case under care, and in it there are certainly three headaches. One is a constant ache of the vertex and frontal region, which has lasted three years, with flushed face, and more or less throbbing on use of the brain, or from excitement, emotion, or prolonged exercise. Then there is also an inconstant occipital headache due to eye-strain, and, lastly, attacks once in two or three weeks of typical neuralgic migraine, with mild ophthalmic prodromes and nausea. The asthenia and anæmia were both extreme, but yielded readily to the "rest treatment," after all else had failed. The migraine has become less severe and less frequent, as is apt to happen when the level of health is lifted, but the occipital ache is still brought on by use of the eyes, though it will now, I believe, yield, the patient having become able to endure the trial of a full optical examination.

I hesitate just where to put the not rare cases of children below the age of puberty, who declare that they are subject to constant frontal ache, which increases whenever they study, and is apt to become severe an hour or two after school-hours begin. In some cases we can exclude malingering, digestive disturbances, eye-strain, and, in fact, every other ordinary cause of headache, and find ourselves driven to believe that use of the brain for study in the growing child is sometimes capable of giving rise to steady headache, with flush of face and cold extremities.

There remain for consideration rare cases of permanent headache in the adult, for which, so far, I can find no satisfactory explanation. Here is an illustration. A man, aged fifty, of active mind and wholesome body, consulted me last spring on account of headache. He said, "When I was about sixteen I had to work hard all day, and tried at night to educate myself. After three years I began to have



headaches, which were certainly increased by all hard use of my brain. These became more common until I had, when about twenty years old, a constant pain; I may say that it has never left me. At times I forget it; at times it is worse, but I can rarely say now what will so increase it, except that to be costive does this, but also too sharp purging makes it severe. Certainly excessive physical work will do this. It is usually a dull ache of the front half of the head, but, if bad, the whole head aches. Very rarely, of late years, I have added a pain over my left eye and sick stomach, but this is different." Despite the headache, he had led an active life of large affairs, resulting in unusual success. Within two or three years his headaches were at times far more severe than had been the case, and also he had begun to have rheumatic aches in the extremities and back. The most rigid examination excluded malaria, obvious gout, the eye, the kidneys, and the stomach as parents of the pain; nor was it possible to indicate a suspicion of a cause. His blood was in good order, and if he might have been said to have been a little below the standard of high health, this was all. A course of tonic treatment helped him in a measure. He was enabled to sleep better, to eat with more appetite, and to exercise with less fatigue. But, nevertheless, the headache remained much as it was before, despite the most varied treatment by many able men. There can be no better example of this unpleasant, and fortunately rare, disorder. I could easily multiply cases. The one I mentioned at the beginning illustrates the fact that sometimes these aches disappear at about the age of fifty.

Two of the worst permanent headaches known to my experience were associated with asthma, and both were probably of congestive type.

W. C., aged twenty-six, consulted me at the Infirmary many years ago for persistent headache. The pain was constant, and was at times severe. It affected the entire brain, and was, as he said, "a solid pain," with which he awakened, and which he took to sleep, and found present whenever he became conscious. Any physical effort, if sudden, made it worse, and he had to be careful as to straining at stool, or lifting a weight. Use of the brain did not seem to do harm, and he could read and write without pain. The headache had existed always since he could remember. The asthma, which was as old as his remembrance, seemed to be accepted as irremediable. It was extreme. He was very round-shouldered, and his face, especially the forehead, temporals, and neck, was marked by large veins, and the eye-ground was so filled with great over-swollen tortuous veins that it seemed

hardly possible that he could have as fair vision as he did possess. The chest presented all the usual deformation of old asthma, and there was, of course, great emphysema, but no remarkable heart-lesions. After much effort to help this unfortunate he passed out of my control without having gained the least relief.

The following case of an unusual form of permanent headache is the more curious because of the type being neuralgic. It reminded me of a case seen long ago with my friend Dr. Ellis, of Elkton, Md., in which for years there was every day an attack of atrocious hemi-cranial headache. The locality in which the woman lived caused, of course, a suspicion of malaria, but no anti-malarial treatment was of any use; nor, I think, was change of air.

Mr. C., manufacturer of cars, an able and successful man of forty-five, had, when about twenty-five years of age, a season of business strain, and, at the time, domestic anxieties. At this date, being then a man in fair health, he began to have headaches, which within a few years increased in number and severity. As seen by me he was a man of five feet ten inches, weight one hundred and seventy pounds, competent in all ways. Save for a rather tender digestion, which forbade excesses, he felt well, and I may add was moderate as to his habits, using two mild segars daily and little wine. He denied having had syphilis. His heart alone showed signs of trouble, but, as he had never had scarlatina, rheumatism, nor, in fact, any grave disease, I was in doubt as to what had caused a slight mitral regurgitant trouble. As to this he was indifferent, and said it was there in childhood. His heart was sensitive to exertion and emotion, and the extremities were cold at times without there being anæmia. At all times he was conscious of pain between the eyes or over one eye. This was made worse by excitement, study, emotion, but was not due to eye troubles, as there was in the eyes nothing to account for it. But besides the constant pain, he had from three to five times a week intense neuralgic headaches of singular type. First came abruptly pain over either eye, with pallor, or flush, or alternations of these; next the pain extended in an hour to the back of the head on the same side, and later the whole head suffered, and usually the cervical spine, and at times the lumbar spine,—a dull ache. Increasing in severity during three to five hours, without nausea at any time, these headaches ended always in slight, but general, twitching, and at times, but not of late, in a general convulsion with full preservation of consciousness, but involving the face and body, and lasting not over a minute. There was neither stupor nor bitten tongue, and possibly this remarkable sequel was hysterical.



Certainly it was not checked by bromides. I should add that as the headache increased, the temporal ache grew to be intense, and the whole head seemed to be deeply flushed, whilst nevertheless the temporal arteries did not throb, nor was there within the head any sense of increased pulsation. After the general convulsive seizures, which came only with the worst headaches, the pain faded away, and in an hour or two the patient could return to his business. I have seen at least twice hemicrania which ended in slight convulsive movements of one arm, and left the man usually with slight transient unilateral weakness. I failed entirely to relieve this case. I found no cause for the pain unless the heart disorder is to be so considered, and I fruitlessly exhausted all my therapeutic resources, whether as to drugs or diet. My proposal to tie the temporals, which I had seen of use, was rejected, and I have lost sight of the case.

I cannot leave this part of my subject without a word about the headaches of hysteria, which are often permanent, and those rarer cerebral aches which arise out of an idea, and which you may also label as hysterical if you like.

I saw some time since a handsome ruddy young woman of good weight, about twenty-six, who had experienced, three years before, a mental shock which intensified headaches said to have been present from childhood. The pain was usually over the eyes, but might be anywhere in the head, and at times appeared to cause great suffering.

When seen by me there had been much treatment, and many diagnoses with competent support for several, since there were present far-sighted astigmatism, occasional excess of urates or uric acid, and a moderate amount of disseminated choroiditis. Here was certainly food for thought. The eyes were glassed with care by Dr. De Schweinitz, and an insufficiency of the internal recti met by prisms, and at last operations. I was surprised to find so little relief. The lithæmic states were then carefully attended to until the urine became clear of all sediment, and it was likewise made certain that the eye-ground lesions were not due to a specific inheritance.

Nevertheless the headaches continued. The general health was so good that I could not hope by raising it to relieve the pain. When at last in a state of therapeutic despair, and she still so obviously incapacitated by headache as to make life valueless, I chanced to learn that at times her headache left her and was replaced by palpitation of the heart or by pain in the side. This might have been a gouty transfer, but I was also told that more rarely the pain was transferred to the throat, and that with this there came a sense of suffocation and

violent spasmodic cough. It at once became possible that I had to deal with an hysterical condition.

I now ordered my patient to abandon all care of the headache, to go out daily, to use her eyes and herself as if she had no headaches, and to see what would happen. I explained to her as well as one may the character of these hysterical phantom-aches, and won her agreement to live as if she had no pain. To my delight and her own, the first fortnight ended a malady which had lasted since childhood. I shall be told that she was cured by suggestion, and I have no objection to this. A case still more severe, of years' duration, and the offspring of overwork, emotional excitement, and an accident, is described in my "Lectures on Nervous Diseases." It, too, was cured by an order to consider the headache as no longer a thing to be respected. The letter from the patient as to her pain and her cure make the case one of the most interesting in its psychical aspects known to my experience.

The symptomatology of the more puzzling persistent headaches is but too simple. There is pain in varying amount for years, and this is all. It is interesting to be able to add anything to this meagre statement. A curious, and I think a novel, point in their pathology has been lately brought to my notice by my able clinical assistant, Dr. De Schweinitz. While examining cases of enduring headache, he has found so notable a modification of the color-fields as must lead us to a careful study of the influence of all headaches on the visual fields. I leave Dr. De Schweinitz's brief notes to speak for him as to this question, and trust, before long, to see it examined more fully.

He says, "The following briefly are the facts in regard to the headache cases concerning which you wrote to me. I have seen three cases in which the headache was absolutely constant, with occasional exacerbations. Two of these patients were your own, one a colored woman from Washington, the wife of a clergyman there; the other a Miss S., at present in the Infirmary Hospital, whom I examined only a few days since. The third case was that of a young girl in her twentieth year, in whom the cause of the headache was never determined, although she was examined in a great many different ways, unless, perhaps, a recent examination which disclosed some chronic disease of the lining of the frontal sinus may explain it. The other functions in this girl were normal. Several other cases I have seen in which the patients were never free from an uncomfortable feeling in the head, not always amounting to actual pain, and associated with very frequent and violent explosions of headache. It is on all of these cases that I have made the brief observation which follows.



“In a certain number of cases of chronic headache with normal visual acuity, or with a visual acuity rendered normal by means of proper correcting lenses, and with no ophthalmoscopic appearance of optic nerve disease, I have observed varying degrees of contraction of the field of vision, not only for colors, but also for form. This contraction usually has been from five to thirty degrees, and, when the head-pain was more intense upon one side than upon the other, or when it was localized upon one side alone, the field of vision on the corresponding side was more contracted than its fellow. This, I thought, would prove to be an invariable rule, but in one of the most marked cases of contraction which I have seen, and a copy of whose fields I enclose, the greater contraction was present on the least painful side. The following are the brief facts in regard to two of the cases :

“S. M. M., a male aged forty-five, had violent headaches for a number of years, sometimes on the left and sometimes on the right side, the right side always the worst, and frequently accompanied by numbness of the left arm and leg. There was a history of malaria when the patient was in the army ; no history of gout or rheumatism ; family history of headaches ; heart and kidneys normal. The patient had been on all sorts of treatment, and had been glassed and reglassed a number of times without much benefit. The visual fields are in this instance smaller on the side least affected in the most violent explosions, but the headache was never constantly localized in one place.

“Miss S., a patient at present in the Infirmary, if her statement is correct, has constant general headache with explosions of severe pain. This headache is not specially localized. She has a nearly constant flush of the face. The almost exactly similar contraction of the field of vision in each eye is very prettily shown in the charts of her eyes. The field for red is contracted above and below, but is not universally concentrically contracted, as is the case in the form field.”

I find nothing more difficult to talk about than the treatment of headaches in general, and when I come to speak of what I call permanent headaches, I have little to recall which is encouraging. To shut out lithæmic states involves far more labor than is usually imagined, nor can it always be surely done, and gout is full of surprises for the most careful. But if we are fairly certain that it is not gout in any form which is to blame, and can feel secure that the kidneys are sound, the nasal passages healthy, the eyes not in fault, and made sure that there is no syphilis, what have we left? I have said that permanent headaches of the type of migraine are rare. Nevertheless

this does not absolve us from the need to know if the eyes are in order, and also if the general level of health be high. In fact, no man has completely dealt with the therapeutic possibilities of a headache case until he has seen to it that the health is in the highest state attainable for that individual, and I at least can recall many instances in which success was won in this direction where mere use of single drugs had failed.

It is not rare to find that to lift the health-level is to enable drugs to act favorably, which have failed to do so until this has been accomplished. I have now in my care an example of violent ophthalmic migraine occurring at least twice a week in a notably asthenic woman. Every effort to help her failed, and travel, spas, tonics, and cannabis in large doses were tried in vain. After adding to her experiences of drug failures, I laid aside all means but "rest treatment," under which she rose readily seventeen pounds in weight, and acquired an excess of blood-corpuscles. The headaches became far less frequent, but remained nearly as severe, until now, under moderate doses of hemp, they have rapidly lessened both in number and severity. I do not know how cannabis acts in these cases, but I do know that it does best with those who are best off as to health. In the last case mentioned there was as nearly a complete cure as one is likely to get in migraine. She still has a headache, and not a bad one, before or after the menstrual period, but at no other time.

I wish here to return to the question of the treatment of permanent occipital and other distress, the undoubted offspring of excessive mental labor with uncorrected and imperfect eyes. The eyes are corrected, great results promised, but, alas, little gain is seen. If the man "with blinded eyesight, poring over miserable books," will go and live in the woods, where he has no books, rest of the eyes and the tonic of outdoor life will in time make him well. Or, if he or she cannot do this, it may be possible to do more artificially what were better done naturally. The centres which govern the accommodative movements, or those of the eyeball, have so suffered as to be unable painlessly, or without causing distant reflex consequences, to carry on their functions, even when aided by glasses. Is a permanent tire of brain-centres possible? I cannot say. Assuredly permanent results of incessantly-repeated fatigue are very possible. As a consequence of this we may rest sure that it is not enough in some cases to glass the eyes, for a mischief already done before they were glassed may defy such good as the best correction assures. I have seen such cases cured by ordinary toning influences. Any are



more desirable than what is called "rest treatment." But where all others fail it may succeed. No matter how we restore health, when we do so thoroughly, the centres cease to feel as acutely. Their power is more easily exerted, and with less strain; and then, with the aid of a lightly-applied frequent cautery to the neck, and cold douches to the upper spine, we may hope to get rid of the consequences of years of eye-strain. It was useless to make the patient well as to all other organs while the eyes remained uncorrected; as useless to correct these and expect perfect relief if the case be an old one and the general health remain much impaired. A full acceptance of these truths would save a good deal of disappointment after even the best correction of optical defects.

I have said that there were a few persistent chronic headaches which defy the clinical observer who is seeking for causes. Among these, now and then, we find a case which the accidents of the future unexpectedly explain as gouty, and therefore I advise you, when at a loss, to presume for a time that you have to deal with this ancient enemy. Your treatment can do no serious injury, and sometimes justifies the shrewdness of your guess. But, after all, there will still be the permanent headaches which continue despite all we can do, and which seem not to belong to any of the types I have mentioned.

## THREE CASES OF TRAUMATIC INJURY TO THE SPINAL CORD. SHALL WE OPERATE?

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

BY B. SACHS, M.D.,

Professor of Mental and Nervous Diseases; Neurologist to Montefiore Home for Chronic Invalids.

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GENTLEMEN,—The first case I wish to present to you to-day is one of injury of the spine, referred to me by Dr. Gibney for an opinion in regard to the advisability of operation and for the proper diagnosis as to the exact nature and site of the lesion giving rise to the symptoms. The history is this. About one year ago the young man, aged nineteen, was engaged in work as a plumber, and fell backwards a distance of twenty-five feet from a ladder, striking on the middle and lower portion of the back. He was helpless immediately after the accident, and some time afterwards lost consciousness. He did not strike his head. He had to be carried home, and has been on his back ever since. In addition to the paralysis he had incontinence of urine. The urine is ammoniacal, and he has trouble in defecation. There is very widespread disturbance of sensation. These are the general symptoms. You will also notice atrophy of the lower extremities, not universal, but involving some muscles more than others. Furthermore, he has some ulcers forming on the legs, particularly over both malleoli. Although on his back eight months, his general health is good. The history is in other respects entirely negative, except that he had chills and convulsions two months before the accident, which left him weak for a few days.

With this history to guide us we have first to examine and see what the present condition is, with regard to motion, sensation, and the state of the muscles, and then we shall be ready to form some conclusion as to the site of the lesion and the nature of the process, and whether we can expect to benefit the boy by operation. He can do nothing whatever with his legs; they are in a state of complete paraplegia; but you



notice that they are not contracted, and on either side I can move all the joints perfectly well. On further inspection we see on both sides marked atrophy of the anterior tibial groups, while the posterior tibial muscles are flaccid. The thigh muscles, though not so much involved as the muscles below the knee, are somewhat atrophied. So much for loss of motion. The next point will be to determine to what extent tactile sensation is modified, and whether the pain sense, the muscular or temperature sense is affected. This cotton test will show you the limits of normal sensation. You see that he does not feel the touch distinctly until I get to a point two inches above Poupart's ligament. There is a small area just below the groin on the right, where he has some sensation yet. The area of absolute tactile anæsthesia is most marked two inches below Poupart's ligament. Just below the ligament there is an area where he has some little doubt as to whether he feels or not. Cotton is a very fine test. Applying a grosser test, the area of tactile sensation is found to be about the same. Testing him for pain sensation, I prick him with this pin, but he does not feel anything until I get to the line of anæsthesia, just above which point he feels it very well. We have then an area of absolute loss of pain-sensation below, and when we approach the normal parts just above the line there is an area of hyperæsthesia. This slight area of hyperæsthesia is just above the area where tactile sensation begins. As I bend his toes he recognizes the movement, although he has no knowledge of what I propose doing, and is not able to feel the touch of the skin. The muscular sensation is preserved, in spite of the fact that there is a complete anæsthesia. He can tell that I am bending his ankle, but does not perceive that I am moving the knee, so muscular sensation is lost at the knee, but at the hip it is preserved on one side and absent on the other. So muscular sensation is preserved in the foot and ankle of the right side, but is lost on the left side from the ankle to the hip and on the right side from the ankle to the knee. We can also note changes in the temperature sense. I apply cotton soaked respectively in very hot water and cold water at different points over his limbs, but he does not feel it until I get to the line of anæsthesia. The temperature sense is therefore abolished exactly in the same way as the touch sense. All forms of sensation as well as motion, therefore, are lost, with the exceptions noted in regard to the muscular sense. The next point to test will be the condition of the reflexes. The ordinary plantar reflex is gone; there is no ankle-clonus, and the knee-jerk is absent on both sides. There is a slight cremasteric reflex, and the abdominal as well as epigastric reflexes are also slightly present.

All these things have to be tested in order to determine the exact location of the lesion. The next point in the order of examination would be to make an electrical examination of these muscles. We make a faradic test to find if that reaction be present, but learn that it is absent. As there is no cutaneous sensibility here, we can use very strong currents, but you see that even with them there is no response. At the point where he begins to feel the faradic current, you can judge that sensation is tolerably normal. He does not feel it below the line of anæsthesia, and we get no reactions from any of the muscles ; but when I apply the pole to the abdominal muscles, they contract very promptly. Sometimes the contractions are very slight, and you have to place your finger on the muscles in order to perceive them. There is no contraction of either anterior tibial group, and there is none of the posterior group of the left side. The current is very strong, but we get no contraction whatever. The electrical reaction is altered all over the leg, as we might infer from the very large amount of atrophy. I shall next make a galvanic test to see to what extent the muscles are affected. You notice that with the galvanic test we get slight contractions with a current of twenty-five milliampères from the posterior thigh-muscles, but no contractions in the anterior tibial group ; and in those muscles that do contract we notice the effects of anode and cathode to be about the same. There is, therefore, a complete reaction of degeneration with loss of faradic response, and with anodal contractions as great as the cathodal in some muscles ; and, furthermore, atrophy so marked in other muscles that even the strongest current will not excite a response. I need not demonstrate the fact that he has no trouble in the upper extremities.

On examination of the back we notice a slight lateral curvature. Now, the question is, whether this deformity which you see in the spine is the seat of the trouble, and whether the symptoms correspond with the site of this spinal deformity. In other words, is this lesion the whole trouble, and are the symptoms in the lower extremities to be ascribed entirely to it ? As regards the further symptoms, the limit of anæsthesia indicates that the trouble comes from the upper lumbar region.

The reflexes must be considered next. I explained to you what the ganglion-cells of the anterior horns have to do with the reflexes. The cells connected with the knee-jerks are to be found in the second lumbar segment. The abdominal reflexes are connected with cells situated in the lower dorsal region, from the seventh to the eleventh segments. We have tables showing at about what level certain reflexes belong. To show the value of these tables, I need only say that cases



have been reported in which the ankle-clonus was present and the knee-jerk absent, showing that, though the ganglion-cells of the second lumbar segment were involved, the cells lower down were normal. Here we have absence of all the reflexes in the lower extremity, together with marked atrophy and disturbance of electrical reaction, all of which symptoms point to this conclusion, that the whole of the spinal cord below the twelfth dorsal segment is involved in the disease. Let us see how large it is and how it corresponds with the knuckle. In order to determine the exact site of the knuckle, begin at the vertebra prominens and count downward. Here we find it at the twelfth dorsal vertebra. We should be careful about this, for serious mistakes have been made. The twelfth dorsal is the most prominent, and the entire deformity lies between the eleventh dorsal and the first lumbar vertebræ. Inasmuch as the cord stops at the second lumbar vertebra, we see that the part of the cord which has suffered most lies under or nearly under this knuckle. It is comparatively a simple case as regards examination. In other cases with the lesion much more limited, it might be more difficult.

In considering the prognosis of this case we must recall the fact that, in addition to the other symptoms, there is incontinence of urine and the urine is ammoniacal, from which you may infer serious possibilities. Moreover, it is eight months since the trouble began. You will all come to the conclusion that this patient is in rather a bad shape. He is absolutely bed-ridden, and probably will be so for all time. The question is, whether anything is to be expected from operative interference in a case with these symptoms. Without the history of traumatism we should make a diagnosis of complete destruction of the cord from the twelfth dorsal segment downward. The symptoms show that there is not a portion of the spinal cord in this region which is able to perform anything like its normal function. For eight months the cord has been pressed upon by dislocated vertebræ. It has been crushed, and probably, in consequence of that injury, the process has extended further down. If you were to examine the cord now, you would probably find the injured portion in a semifluid condition. No operation under the sun could improve such a state of affairs. We have tried operation in cases more hopeful than this, where there was but a slight paresis and anæsthesia and no bed-sores, and in which there was a distinct knuckle, making pressure on the cord. We have had experience with three such cases, but I can't say that there has been any improvement, although the operations were done skilfully. Hence, in a case of this sort, I am distinctly opposed to operation, for even in the

present state of spinal surgery, an operation would simply be the means of hastening death.

It was my purpose to show you the method of going to work to determine the level at which the trouble is situated. The wide-spread symptoms point undoubtedly to the fact that the spinal cord is disturbed at more than one segment. The disturbance is not limited to the area which is actually crushed, but that portion of the cord below it is also heavily involved; so that even if we were to relieve the pressure at one point, we could not restore the condition of the cord underneath. The case is a sad one for the poor young fellow, who in consequence of his traumatic myelitis will have one bed-sore after another until the inevitable end comes by some entirely unexpected disease or from pyelonephritis. So the prospect now is as sad as can be. If there were any chances that an operation would do some good, I should say operate.

Benefiting by such facts as I have been able to present to you in connection with the first case, let us examine in similar fashion the young woman now before you.

CASE II.—This girl, aged twenty-one, always enjoyed good health until three and one-half years ago. After that time she developed marked lateral curvature of the spine with severe pains in the back and legs, and since then has had difficulty in walking, which increased so rapidly that for the past two years she has been unable to walk, and has been confined to her bed. Four years ago, before the lateral curvature appeared, she fell down-stairs, and states that in falling she struck on every step. Evidently the traumatic injury is a fact that we cannot leave out of consideration. The patient was formerly very stout, but has grown thinner in the last few years. She has no cough, and there is no phthisical history.

This, gentlemen, is the entire history that we have. With that history we proceed to make an examination to determine how many of the symptoms, if any, are to be attributed to the spinal deformity, and whether operative interference would promise any relief.

In observing the patient's legs, you will notice that her feet are not at a normal angle with the legs,—instead of being nearly at right angles, the angles are obtuse. Both legs and thighs are much emaciated.

I ask her to move her legs in order to see how much power is left. She is able to lift her legs from the bed, also able to lift her left leg by action of the anterior thigh muscles; we can say, therefore, that the action of these muscles is tolerably good. She can move the toes and feet upward and forward, but is not able to bring the feet up as she normally should. Notice that the muscular force in the foot is extremely slight,



but that the force of the right posterior tibial muscles is very well preserved. On the left side, the posterior tibial muscles are almost powerless, as you see. Although there is no complete paralysis, the paresis is extreme. She is able to exert all muscles slightly with the exception of the anterior tibial group of both legs.

We shall now endeavor to determine the amount of sensory disturbance. The right leg has no feeling on the anterior surface, and there is loss of sensation on the dorsal surface of the left foot. She has feeling on the outer side of the left leg, but none on the outer side of the right leg. Notice the fact that the flat surface of the right foot is rather insensitive to pain, while the dorsal surface is more sensitive. Conduction of pain is delayed. Sensation is not so much interfered with as we should expect from the motor symptoms; and that is the first great point in this case.

We shall now make further test with hot and cold water. On the right foot she has no feeling of hot water. To the left foot hot water gives pressure-sense. On the left foot cold water gives a sensation of burning; while hot water is not properly perceived.

This examination shows that all sensation is disturbed on both sides of both feet, particularly on the plantar surfaces, and that there is a condition of hyperalgesia on the dorsal surface, whereas on the plantar surface of both feet we have analgesia. As regards muscular sense, it is very much disturbed. Temperature-sense, you see, is disturbed everywhere, and equally in both legs to the region two or three centimetres above the knee. Above that point all forms of sensation are normal.

The next point to determine will be the electrical reaction of these muscles, particularly below the knee. The muscles, you notice, are distinctly atrophied. To test the muscles we shall use the faradic current, because all we wish to determine is whether there are any electrical changes. If there be no response, we shall know that there is reaction of degeneration in those muscles. On the other hand, if they contract, we know that there is no reaction of degeneration. The faradic examination, which is all we need go into at present, shows some reaction on the part of the posterior tibial group of muscles of the right leg, but that all other muscles of legs and thighs are entirely insensitive to the current, and in keeping with that we have changes in the volume of the muscles.

On the right side, there is no patellar reflex or ankle-clonus; on the left side, the same condition is present.

The abdominal reflex is present on both sides. There has been remarkably little interference with the vesical and rectal reflexes.

In addition to the symptoms, please take into account that she has had a number of bed-sores in various parts, particularly in the sacral region.

Gentlemen, let us analyze what we have found. We have a patient emaciated, with an extreme degree of paresis of most muscles of the legs and thighs. In keeping with this loss of motion, sensation is very much interfered with, except the sense of pain, which, if anything, is increased, excepting upon the plantar surfaces of both feet. Muscular sense is lost as far as the knee. Temperature-sense is lost up to two or three centimetres above the knee. Electrical examination shows marked degeneration in all muscles except the right posterior tibial. All reflexes are abolished. Vesical and rectal reflexes are not much interfered with. She has had bed-sores, but they have done well.

The next thing is to show the condition of the back. You notice very marked lateral curvature of the spine, occupying almost the entire dorsal region, and as far as the first or second lumbar vertebra, if not farther. From the fifth dorsal we have very marked lateral scoliosis.

In the large majority of spinal curvatures there is no interference with the spinal cord, because the cord yields and there is no paralysis. We therefore have to take into account whether this paralysis is to be attributed to this scoliosis, or whether the lesion is of a different nature, and at some point other than the region so apparent here.

So far as the symptoms are concerned, we have a paralysis of all the muscles of the legs, except the right posterior tibial group, with disturbance of sensation up to three centimetres above the knee, absence of reflexes, and very marked atrophy.

All these symptoms point to a lesion involving the lumbar and lower parts of the cord. If the lesion were in the dorsal spine, the symptoms would vary somewhat from what we have here. In a dorsal lesion of the spinal cord we have, first of all, not half the amount of atrophy that we have here. The atrophy of the muscles of the leg is dependent upon the atrophy of the ganglion-cells of the segments of the spinal cord from which the nerves supplying the muscles of the leg come. If you had a marked lesion in the dorsal region, you would have no atrophy in the legs, except that which comes from disuse.

The reflex contractions are all lost. That shows that the lesion is in that portion of the cord through which the reflex arcs pass, which we know to be about the level of the second lumbar segment. If the lesion were higher up we should have, instead of loss of reflexes, an increase in them. In that case, as you know, the tracts which conduct



downward would degenerate from that point, and the result of that degeneration would be to increase rather than abolish reflexes. So you see all symptoms point to a lesion not in the dorsal region, but in the lumbar. Now imagine for an instant that this girl has acute dorsal myelitis. She would have paralysis of both legs, because impulses from above downward could not reach the periphery. The paralysis might be extreme, but reflexes would be increased. Instead of atrophy we should have spastic contracture of muscles; whereas there is no contracture here. If you have loss of reflexes and flaccid atrophy, the lesion is about the level of the spinal cord which represents the roots of the nerves supplying the part affected. If, on the other hand, you have increased reflexes with spastic contractures, and without atrophy, you may be sure that the lesion is higher than the level in the cord represented by the roots of the nerves supplying the paralyzed parts.

We must, therefore, say at once that this large amount of scoliosis is not the cause of the paralysis, because there are no symptoms which point to a lesion higher than the level of the first lumbar segment. The larger part of the spinal deformity covers a part of the cord not involved in this process. As regards the site of the lesion, we have to do with the sacral and lumbar segments of the spinal cord.

The next question is whether there is any marked transverse lesion of the spinal cord or not. One particular circumstance leads us to suspect that the segments of the spinal cord are not much affected,—that is, the absence of rectal and vesical trouble. Those reflexes, after a lesion in that part of the cord, are lost. The fact that these reflexes are not seriously interfered with leads us to ask, What has given rise to these symptoms? You must remember that, in addition to the segments of the spinal cord, we have a large number of fibres anteriorly and posteriorly which join outside the spinal column. There may be injury affecting the anterior and posterior nerve-roots, and leaving the cord intact. If you have anterior nerve-root lesion, you get the same symptoms as from one involving the anterior horn of the gray matter of the cord. In the case of the posterior nerve-roots you get the same symptoms as with a lesion of the posterior horn of gray matter of the cord.

I believe the symptoms show that the greater amount of damage has been done outside the spinal cord segment, and, as you remember, you find the nerve-roots of the cauda equina at this point. I believe the spinal nerve-roots have been involved, and that the spinal cord segment has been affected very little. How that could be affected you

can see,—by displacement of the vertebræ, the nerve-roots would be the parts to be squeezed before the segment of the cord itself.

That may seem to be too close reasoning, but you see that this case differs from the others, for if compression in this part of the spinal cord were so extreme that it would be responsible for this amount of paralysis, vesical and rectal reflexes would be abolished. It is for this reason that I say that the greater part of the damage is outside of the spinal cord itself. That conclusion has been reached by careful examination, and would seem to me to justify the inference that the case is more favorable for surgical interference than if we had absolute proof of involvement of the spinal cord itself.

What I would suggest would be trephining the spinal column and removing any old adhesions which may compress the root-fibres of the lower segments. Although the general results have not been such as to encourage us very much, the attempt should be made, and I believe the operation holds out some promise of success. If we can ameliorate the condition so that she can go about on crutches after the operation, something will have been gained. I would favor plaster-of-Paris extension so as to keep the spine immovable for some time.

The operation may be undertaken, gentlemen, and if so, I hope you will have the opportunity of seeing it.

[*Later Note.*—The operation was performed, but the patient died from shock a few hours after the operation.]

CASE III.—I am able, gentlemen, to present still another case. The patient before you is a rather feeble-looking man, thirty-one years of age, who has been brought to me by Dr. Watson, of Jersey City. In this case, again, the decision is to be rendered whether an operation can give relief.

Three years ago, while cleaning the machinery on his boat, a piece of it, weighing many hundredweight, and which was suspended by a pulley, fell down gradually, striking him on the back, and remained lying on him for over twenty minutes. His fellow-workmen have testified to this, and also to the fact that the machinery had to be hoisted before our patient could be released. We need not be surprised to learn that he was immediately paralyzed in both legs, that he was unconscious for half an hour, and that on recovering consciousness he was found to have lost sensation in both legs and as far up as the umbilicus, and had no control over his bladder and rectum. There has been no material change in his symptoms, yet by strength of will he has been wheeled about, and has attended of late to his duties in a post-office. The result of the minute examination we have just made



may be summed up in a few words. There is complete paraplegia with extreme atrophy of all leg and thigh muscles. Sensation in every form is abolished from the toes upward to within a short distance of the crista ilii. All reflexes, including the scrotal and abdominal, are lost. Not a single muscle in the legs or thighs gives any proper electrical response, and, to make this sad picture still more gloomy, you notice these deep ulcers that have exposed the sacrum and different parts of the femur. The urine is ammoniacal, and dribbles away constantly. With the exception of the power of having erections, there is no indication that the lower dorsal, the lumbar, and the sacral segments of the cord are possessed of any vitality. This portion of the cord is thoroughly crushed, and in a semi-fluid state. Under these conditions an operation would be utterly useless.

These three cases will be sufficient to convince you that careful examination should be made in cases of traumatic injury to the spinal cord, and that operations should be attempted only in cases in which the cord still retains some vitality, and in which we may reasonably expect to release pressure upon the cord by operative interference. To accomplish this, it will be necessary to operate as soon after an accident as possible. If a number of months have elapsed since the accident, it will be a fortunate and exceptional circumstance indeed if the surgeon be able to do any good.

## ADULT CHOREA.

CLINICAL LECTURE DELIVERED AT THE PHILADELPHIA HOSPITAL.

BY F. X. DERCUM, M.D.,

Neurologist to the Hospital.

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GENTLEMEN,—I shall take the opportunity to-day of showing you a number of cases of a remarkable affection. I refer to the so-called adult chorea. You will see at once that it differs in several important respects from the ordinary chorea of childhood. The patient before us (Case I.) (Fig. 1) is a man forty-four years of age. He tells us that the disease from which he suffers first made its appearance seventeen years ago. It came on gradually, and became more and more marked with time. As he stands before you, you notice at once that his head performs an irregular upward-and-downward movement, being alternately extended and flexed upon the chest. You observe that the movement is in no sense rhythmical. It occurs at irregular intervals, and is distinctly jerky in character. In addition, the head is at times turned partly to one side. Further, your attention is at once attracted by the arms. They are, as you see, in constant motion. They are alternately flexed and extended, thrown from the body or drawn to it, while the hands and fingers are made to assume bizarre positions. In fact, you observe that his entire attitude is grotesque; and when I ask him to walk you see that the leg-muscles are also involved. You notice that his walk is very peculiar. His stride is long and halting, and reminds one forcibly of the ordinary stage-walk of the actor. This theatrical appearance is enhanced by the fact that there is, as you see, every now and then a much exaggerated pause at the end of a stride, during which the entire body droops greatly forward and the head slightly sinks, just as though the patient were granting a gracious though dignified recognition to some one before him. How much these movements differ from those of ordinary chorea I need hardly point out. As a whole, they are more jerky, though at times much slower and complex, numerous groups of muscles being associated in







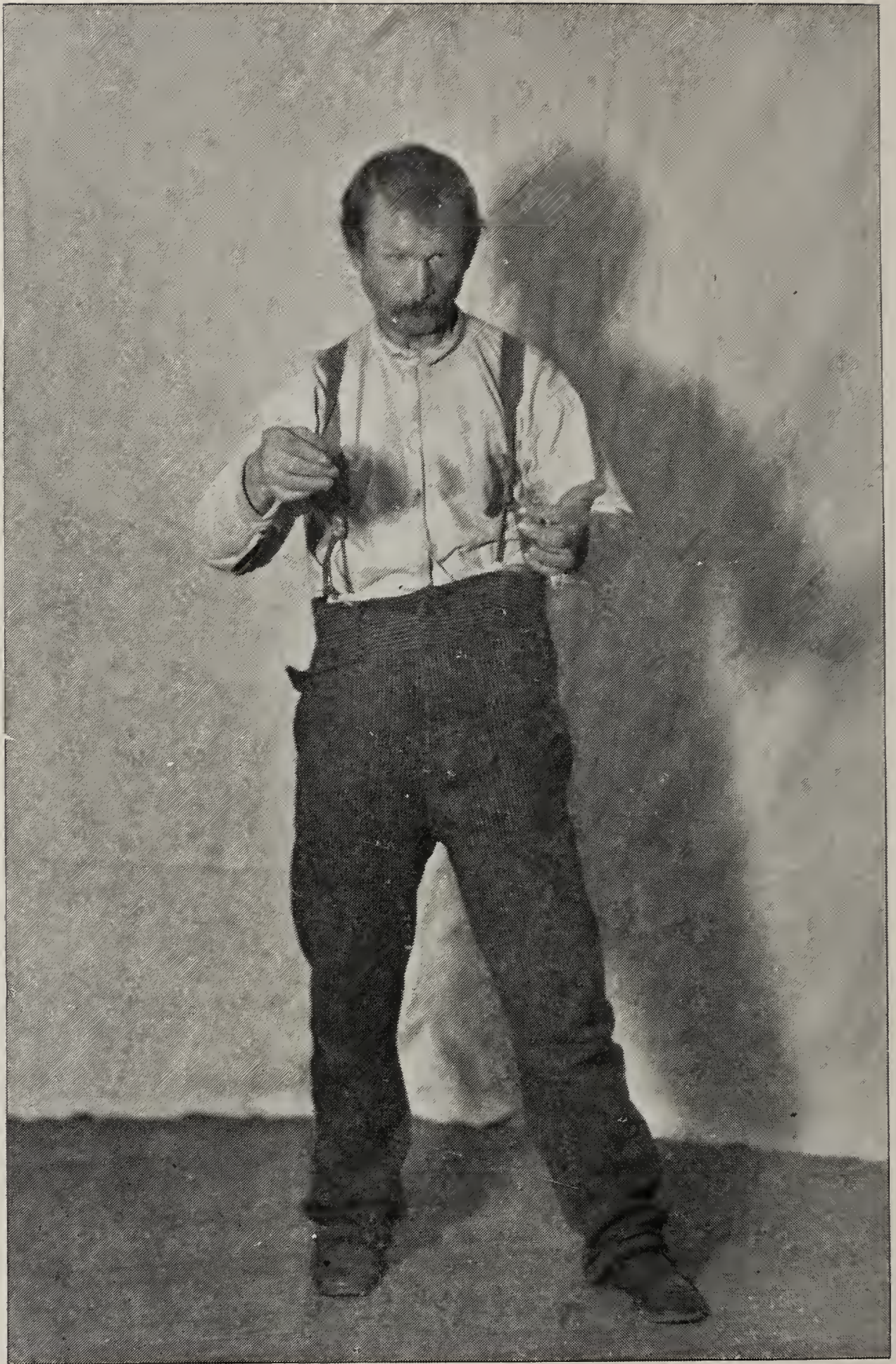


FIG. 1.—Adult Chorea. Showing the dramatic position involuntarily assumed.





FIG. 2.—Adult (Hereditary) Chorea. Showing excessive and rapid movements. The arms are blurred in the figure in consequence.





the same bizarre and purposeless gesture. Again, when I ask him with regard to a previous history of rheumatism, which, as you know, is so common in ordinary chorea, I obtain a negative answer; and, in fact, before I can ask any further questions in reference to a possible etiology of the affection, the patient, as you hear, volunteers the statement that his father had suffered in a similar manner. In his father the affection began when twenty years of age, and continued until his death twenty years later. He further tells us that his sister had also suffered from this disease. In her case it had commenced at ten years of age, and had continued until she was thirty-five, when she died of some other affection. Here at once is an etiological factor foreign to ordinary chorea.

You notice as the patient speaks that he does so with difficulty and apparently with great effort. Indeed, if he attempts to speak while sitting down, the exertion is so great that he is compelled to rise from his seat, and violent contractions occur in the muscles of the face and throat, and even of the trunk. The speech is very irregular, being short, jerky, and drawling by turns.

You observe that there is nowhere any palsy, though there is some general weakness. When I test his sensation I find that it is everywhere quite normal. His knee-jerks, however, are, as you see, quite exaggerated. I can detect no mental impairment, and there is no change in his eye-grounds. He suffers absolutely no pain, and, unless the movements be very violent, is practically unconscious of them. The nurse tells us that during sleep the movements cease altogether. With excitement and with special exertion, such as the effort of speaking or of walking, as you yourselves have seen, they become distinctly worse.

Before we deal with the future of this man, let me show you some additional cases. Here is another (Case II.), a man aged forty-four years (see Fig. 2), whose family history is exceedingly interesting, and which I will briefly detail. The disease first made its appearance in the family of his paternal grandmother. The latter had six children, three sons and three daughters. Of these, two sons and one daughter suffered from the disease. His father, however, escaped, and to this fact I shall presently return. The patient has no brothers, and but one sister, who was also affected. In himself the affection began at thirty-five years of age. He commenced to have trouble in walking, and frequently staggered, due to involuntary and irregular movements in the legs. Later on the arms also became choreic, and finally the disorder spread to the head and trunk. Some years ago, when

under the care of my colleague Dr. Sinkler,<sup>1</sup> he could still walk, but now, as you see, walking is impossible. As he sits before you and I ask him to rise, the legs are thrown violently about, as are also the arms, while the head is forcibly flexed and twisted to one side. When I ask him to speak, you hear that, as in the other patient, the speech is very irregular, jerky, and long-drawn by turns.

As in the preceding case, the knee-jerk is exaggerated. There is nowhere any impairment of cutaneous sensibility; there is no pain, the eyes are normal, and the mind is perfectly clear. I should state, however, that the aunt who suffers from this disease is at present confined to an insane asylum. I may tell you, now that the patient has been removed, that it is not uncommon to find insanity associated with this form of chorea. As you have heard, his trouble has gradually become more and more marked. After a while it will be impossible for him to leave his bed, and, finally, mental impairment and general exhaustion will supervene, or some intercurrent disease will terminate his career. With care, however, his life will probably be prolonged for many years. As you may imagine, however, this disease belongs to a class of affections which are incurable.

Regarding the family history, it is interesting to note that the father escaped, especially as Huntington, one of the earliest writers to describe this affection, maintained that if the chain of heredity was once broken all future offspring escaped. When we inquire into details, however, we find that in this family the affection never developed before thirty-five years of age, and, further, that the father of this patient died at thirty of an accident,—*i.e.*, before the time had arrived for the disease to manifest itself.

The next example of this affection is a negro, aged twenty-two (Case III.). His family history is briefly as follows. His mother and one sister died of phthisis. One brother, now twenty-six years of age, began to have St. Vitus's dance at three years, and this persisted up to the present time. He has, however, always been able to walk and help himself. A sister, aged twenty-one, also suffers in the same way, the trouble beginning at the age of sixteen.

Up to five years ago the patient had worked on a farm. One day while very much overworked and exposed to a very hot sun, he suffered, as he says, from a sunstroke. He was quite ill for several days, and while convalescent the jerking of the arms and legs began. It soon involved the muscles of the head and trunk, and increased very

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<sup>1</sup> See Journal of Nervous and Mental Disease, February, 1889.





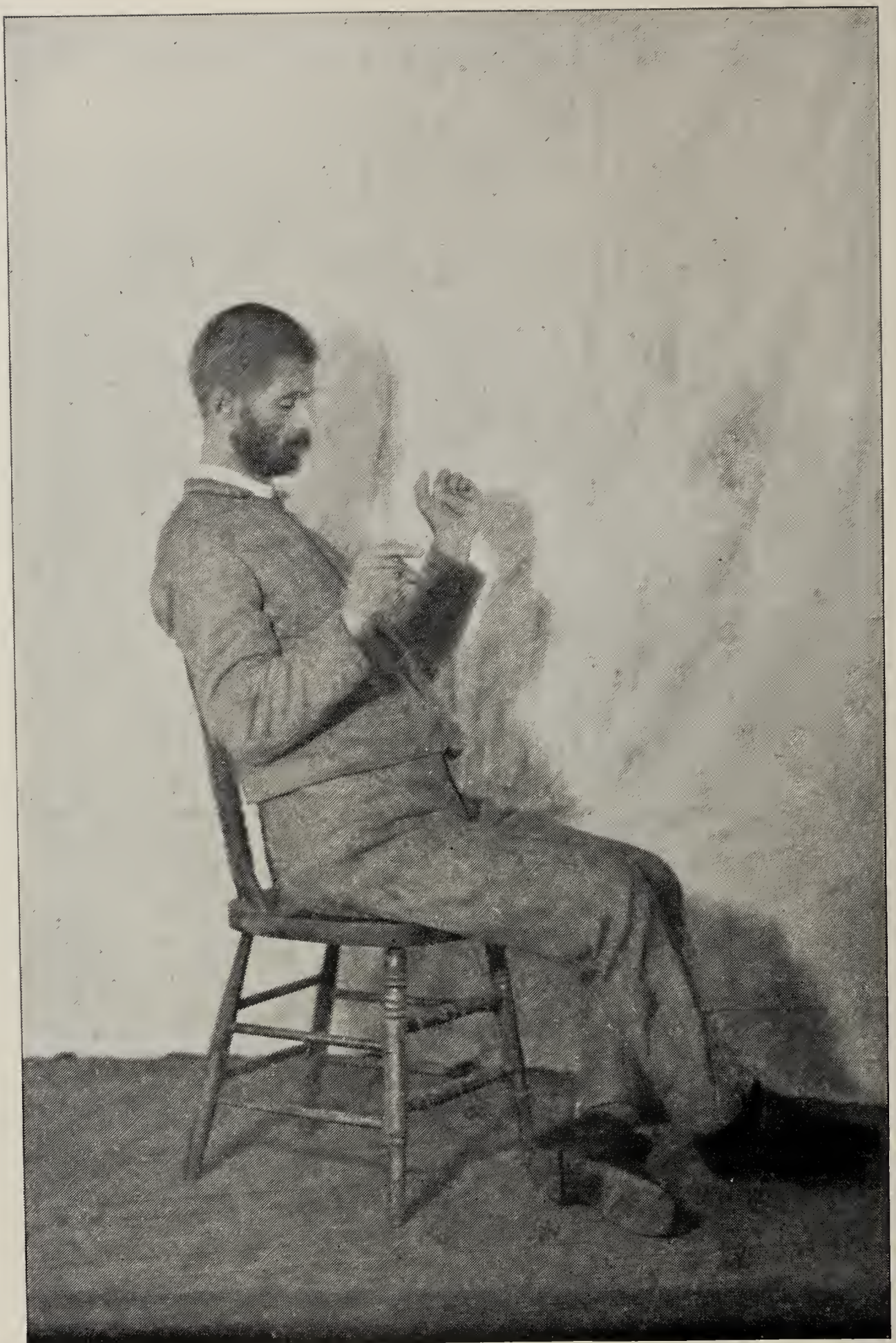


FIG. 3.—Adult Chorea. No history of heredity.



much in severity. When first admitted into the house he was still able to walk, but now this is impossible. As I have already pointed out in the preceding cases, the movement in hereditary chorea is apt to be more jerky than in ordinary chorea, and this feature is markedly accentuated in the present instance. As you see the man lying before you, his arms and legs are violently jerked, almost tossed about. In fact, now that he is quite excited by being in your presence, his movements are so violent as almost to suggest a convulsion. In the ward, if unobserved,—*i.e.*, if no apparent attention be paid to him,—he will become comparatively quiet. Every now and then, however, a hand is raised and let fall, or an arm is flexed or extended, or the head and shoulders are suddenly raised from the bed. Voluntary effort of any kind markedly increases the frequency and violence of the movements. They may become, indeed, as already stated, almost convulsive in character. Speech is exceedingly difficult for him, and is at present almost unintelligible, it is so short and jerky and so frequently interrupted. Investigation of the cutaneous sensibility and special senses yields, as in the other cases, negative results. His knee-jerk, as you see, is also much exaggerated.

In the three cases of adult chorea that I have thus far shown you, heredity is a marked feature. Here, however, is a patient (Case IV., see Fig. 3) in no way distinguishable in his general features from the others, in whom no such history obtains. None of his ancestors or any of his living relatives have suffered from the disease. At the age of thirty-one, without having had any previous disease and without any known cause, he began to have trouble in walking. His legs began to be jerked about. As he walks, you notice that his gait is halting and unsteady. Early, however, his arms became markedly affected. As you see, they are suddenly carried far away from the body, and then, partially flexed, are brought to the side, while the fingers assume peculiar positions. His head and trunk are at present also involved. The movements have gradually grown more and more marked. As he sits in the chair he finds a position of comparative rest when the legs are crossed and the arms and hands are held before him. As in the other cases, his knee-jerks are increased, and the same negative features obtain in reference to cutaneous sensibility and special senses as in the other cases. Here, then, would be an instance of adult chorea resembling in every way the hereditary affection, and the inference that we are justified in forming is that here is probably an instance in which the disease is observed in the first generation affected.

Here is another suggestive case (Case V.). This is a woman, forty-

eight years of age, and unmarried. She passed through the menopause some six years ago. Had not suffered from any special illness, as far as she could remember, for many years back. All her life she had been keeping house for her father, doing general housework. Two years ago she received a blow on the head which completely stunned her. The peculiar movements that you see came on immediately after the accident. They are now no better and no worse than they were on the first day. Here is evidently a case that differs widely from those I have already shown you. Not only is there an absence of an hereditary history, but the history of sudden onset is very different from the story of gradual development which you heard the other patients give. In her general appearance, however, she closely resembles them. The movements involve markedly, as you see, the arms and also the head. The knee-jerks are also exaggerated. The age of the patient prevents us from considering the case as merely senile, while again there is nothing about the patient to suggest hysteria. It seems as though we had here an adult chorea that was distinctly traumatic in its origin.

We should not forget, however, that in the colored man I showed you the direct exciting cause of the chorea was a sunstroke, also a trauma, which operated upon a nervous system already predisposed by heredity. Here, in this woman, a trauma has also been the exciting cause, the feature of heredity being absent, but its absence may, after all, be of no more significance than in the man I have just shown you.

The next patient (Case VI.) is a deaf-mute, about thirty years of age. (See Fig. 4.) We have, unfortunately, no history of his case. From what we can gather, he has been in this condition for very many years, and I simply show him to you because of the excessive movement of his arms. The chorea is here associated with a defective mental condition that is doubtless congenital.

The study of these cases of adult chorea may lead us to modify somewhat the views of Huntington. The first three cases possess clear ancestral or family histories; the fourth, which is otherwise indistinguishable from them, possesses no such history. However, the disease must begin somewhere, and, as already stated, this patient probably illustrates the first generation of the disease. Again, it is commonly accepted that the disease ordinarily begins between the ages of thirty and thirty-five. In Case I., however, it began at twenty-seven, and in Case III. at eighteen. In the father of Case I. it began at twenty, and in the sister of the same patient at ten. In Case III. a brother developed apparently the same affection at three and a sister at sixteen.





FIG. 4.—Adult Chorea. Showing violent and bizarre movement of the arms.





Evidently these facts must lead us to modify our views regarding the age at which hereditary or family chorea may make its appearance.

In summarizing the various points of difference between this disease and ordinary chorea, we have first the difference in the ages of the patients ; secondly, the absence of connection with rheumatism and concomitantly the absence of affections of the heart ; thirdly, the fact that the knee-jerks are increased, instead of being diminished ; and, lastly, the very important fact that this disease is incurable. In many cases the movements are decidedly more jerky—even convulsive—than those seen in the average case of children's chorea, but this point is not one on which much stress can be laid. Further, the disease is essentially a progressive one, the patients going from bad to worse, and, as already stated, mental deterioration—insanity in some form—finally setting in.

# THE REMOTE EFFECTS OF TRAUMATISMS AS SEEN BY THE NEUROLOGIST.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY HOSPITAL.

BY H. C. WOOD, M.D., LL.D. (YALE),

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## LECTURE II.<sup>1</sup>—TRAUMATIC SPINAL NEURASTHENIA, OR THE RAILWAY SPINE, SO CALLED.

GENTLEMEN,—In continuing the discussion of the subject which I had the honor to bring before you last week, we come to the consideration of a large and important set of cases which have been variously known in medical literature as railway spine, spinal concussion, secondary spinal concussion, chronic spinal shock, and so on.

The question of *name* for the disorder may seem to be a trivial one, and from a certain point of view it is. On the other hand, the character of the human intellect is such that words are not only necessary for its higher labors, but also materially affect these labors,—*i.e.*, thinking. A name which conveys an erroneous idea may have a very marked influence in spreading erroneous opinions. Most of the names which have been given to the present affection have been etiological or pathological in their derivation. Of etiological names, the one which has had the greatest usage is railway spine; a name which had its origin in the fact that a very large proportion of the cases are caused by railway accidents. The name itself, literally translated, means the spine of a railway. I suppose the spine of a railway may be considered to be the two iron tracks which run across the country, and therefore, by a direct course of logical reasoning from the name, we can prove that excess of iron rail is the trouble from which our patient here is suffering. Moreover, a very large proportion of these cases are not produced by the railway. I have seen them caused by falls down hatchways and stairways, by the overturning of wagons, by the press of steam

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<sup>1</sup> Lecture I. appeared in Vol. I. of INTERNATIONAL CLINICS.



from exploding boilers throwing men down, etc. Two or three of the worst cases that I have ever seen were the results of heavy beatings. In a word, any form of violence applied to the back, if it be severe enough, may produce the condition we are considering. The term "railway spine" does not commend itself.

It is, however, preferable to the name, so frequently used, of concussion of the spine, even if the word "chronic" be put before the term. Chronic concussion is chronic shaking, which is nonsense. The great objection to the term concussion of the spine is, however, due to the fact that the name has a distinct meaning, and is really applicable to a distinct class of cases which have little or no relation to those now under consideration. Every one recognizes that a blow upon the head may produce suspension of the cerebral function, and consequent unconsciousness, and when no gross organic changes occur such case is spoken of as one of concussion of the brain. It is not so generally recognized, but it is certainly a fact, that violent blows over the vertebræ may act upon the spinal cord precisely as blows of the head do upon the brain, with the result of immediate suspension of function. I have seen at least two cases in which such violence has been followed by immediate general paralysis. This condition may be followed, or it may not, by the peculiar effects we are now considering, but in the vast majority of cases the present affection is not preceded by any symptoms of true spinal concussion. The two affections are essentially diverse, and to use the one name for them is to greatly endanger correct thinking.

I do not know whether the term which I have adopted, of "traumatic spinal neurasthenia," will suit the general professional mind or not, but it is as good a one as I can think of. Certainly the disease is the result of traumatism. Certainly it is largely spinal, and beyond all cavil neurasthenia is the basal condition. The symptoms of traumatic spinal neurasthenia may commence at once. They may follow upon a period of unconsciousness or disablement (the direct result of an injury), or they may come on insidiously in a person who has apparently not been injured by the accident. Thus, I have seen the condition well developed in persons who have passed through a railway accident, and labored long in saving the injured. I call to mind, whilst speaking, one case in which a man was thrown out of a house by a boiler explosion, got up, and walked home some miles, believing himself to have escaped all trouble.

The symptoms of traumatic neurasthenia are subjective and objective. The subjective symptoms, of course, can be feigned with almost

absolute fidelity ; the objective symptoms can only be roughly copied. Thus, a man can tell you that he cannot move his back without pain, and that the slightest touch gives him agony, that he is unable to think or to read with comfort, and that his spirits are depressed, and his general powers of work all gone. All this he might tell you without suffering from any other disease than that of being a liar ; but a man can scarcely alter his knee-jerk to suit the whims of the hour, or at will throw into spasms localized groups of muscles in the back or elsewhere. Any such attempts at counterfeiting ought to be readily detected. In the wager of battle, which we now fight out in the court-room instead of in an arena for combat, when large interests are at stake, men view with grave suspicion subjective symptoms, and even the objective symptoms of traumatic spinal neurasthenia may be closely mocked by hysteria,—that marvellous affection whose simulations at times deceive the very elect. I am, therefore, well pleased to show you a case of traumatic spinal neurasthenia in which motive for simulation is completely lacking, and in which hysterical manifestations are not more present than they are in all similar cases.

The master-builder whom I bring again before you, you remember, was hurt on the 14th of last June. He fell unconscious, and when he awoke found himself lying on a board, from which he was not able to get up and walk away until late in the afternoon. Since then he has been unable to attend to business at all.

Since the occurrence of the accident Mr. S. has been entirely disabled from work, or any reading or other mental application ; exceedingly nervous, excitable, with depressed spirits ; occasional headaches ; much ringing in the ears ; broken sleep. His gait has been irregular, halting, peculiar, as you see it now, when he walks across the clinic room. He goes with more or less of a stoop forward and much uncertainty of movement. He has had two forms of cerebral attacks ; one of short, brief moments of unconsciousness, the other attack of longer duration, in which he is said to be actively, but not aggressively, delirious. He does not remember either of these paroxysms after it has passed.

In examining a patient like the present, the first thing to do is to strip him, so that you can get a full view of the back, for the local back-symptoms are usually the most characteristic and most pronounced. You note now, as the man stands before us, that there is a distinct lateral curvature ; that there are tremors due to persistent irregular, almost fibrillary movements of the muscles in all portions of the back ; that the erector-spinae muscles, especially on the left, are unduly promi-



ment and rigid; and when he makes a movement forward or laterally, you see that suddenly these muscles start out from the back in extreme spasm, and that this functional activity, or tendency to spasm, is so excessive that his trunkal movements are very much restricted. He bends forward with great slowness and evident pain; and he bends laterally with even greater effort. When I approach his back with my hand, he shrinks noticeably; the slightest touch evidently gives him intense pain. This tenderness is not confined to the limits of the vertebral column, but, as is usually the case, extends all over the back; and, as is rather unusual, in the present instance extends into the back portion of the upper arms. The superficial tenderness is also associated with pronounced deep-seated soreness, so that pressure on his head, jarring, quick movements, anything that does violence to the back, gives intense pain. In his arms all natural movements are present; and yet, when I give him this dynamometer, on which I very readily throw the needle around to 130, he is only able with his left hand to get a grip of 25, and with his right hand of 15. There is therefore no paralysis, but pronounced loss of power in his arms. Undoubtedly the same condition exists in his legs, as is shown by his inability to walk any distance. As he stands here this moment, notice the sudden change of color in his face and upper parts of the body, while at the same time he complains of a sensation of heat. You see that he is having one of those peculiar vaso-motor disturbances that are so common in women at the change of life, and which are known by them as "flashes,"—the sudden sensation of heat extending to the face and hands and neck, and often over the whole surface, accompanied by marked flushing of the skin and not rarely also by a sudden outbreak of sweat. This is a neurasthenic vaso-motor symptom, dependent, evidently, upon an excessive mobility of the nervous system such as accompanies weaknesses like those of hysteria, in this instance affecting particularly that portion of the nervous apparatus which presides especially over organic life.

We will now put Mr. S. in a position to test his knee-jerk. Usually in cases of this character this reflex is exaggerated, but an almost characteristic point about it is its variability, so that on one day the knee-jerk may be exaggerated and the next it may seem sluggish; and even at the single examination variations may occur. This appears to be dependent upon the weakness of the reflex centres, which predisposes them to become exhausted. In the normal individual, tap the patellar tendon twenty times and the result is uniform, but in these cases you may often see the apparatus giving out, as you repeatedly excite it,

so that an excessively active jerk can be converted into a feeble one. There,—you see the knee-jerks are distinctly exaggerated.

In many of these cases ankle-clonus exists; more frequently, I think, it is absent. Not rarely you can get in the anterior muscles of the leg the so-called “paradoxical contraction,”—*i.e.*, the muscles when stretched remain quiet, when forcibly relaxed go into spasm. As I forcibly extend the foot of our patient no ankle-clonus occurs, but notice, that when I flex it, the anterior muscles spontaneously contract and their tendons stand out almost as rigid as iron.

On asking our patient as to his sexual powers, we find that they have not been lost, but the sexual apparatus shares in the nervous weakness and irritability, as shown by the occasional occurrence of emissions and by premature emission during the sexual act. Control over the bladder is not lost, but here, again, the fact that he has to get up three or four times in a night to pass water shows weakness with irritability. Just here let me say a word to you of caution,—always examine the urine of these cases, since, although writers upon railway spine often fail to mention it, these injuries sometimes produce true saccharine diabetes. I found not long since in the urine of one of my cases ten grains of sugar to the fluidounce, and the writings of Griesmyer, Fischer, Kaemnitz, and others prove that not only blows over the kidneys, but even more frequently general concussions of the body by falls, etc.,—*i.e.*, just such accidents as cause traumatic spinal neurasthenia,—are followed by true diabetes.

I have thought that possibly it would be interesting to you to compare the symptoms which I have demonstrated in Mr. S. with those I have obtained in the cases of other patients. Let me, then, give you from my note-book,—

First, a mild case. “Mrs. S. was struck violently in the back by a railroad truck heavily loaded with baggage. Previously a healthy woman, she has since been an invalid, with frequent attacks of pain, commencing at the seat of the original injury, radiating into the head and down the back, ending sometimes in attacks of partial unconsciousness, once or twice in attacks of mild delirium. She is unable to sweep, sew, or attend to any household duties, because any use of her arms and back brings on the attacks of pain spoken of. Examination of the back shows that there is no marked superficial tenderness, except in the region of the seventh dorsal vertebra, where she was struck; that movement is not very much restricted except when she moves to the right, when there is pain, with a little spasm of the back muscles. Jarring produces some pain; raising the head gives a sense of



relief. The knee-jerks are normal, and there are no general evidences of hysteria." You see in this case, gentlemen, that most of the symptoms are local in character, and that the case is almost an instance of the "sore back" spoken of in the previous lecture; and yet the woman had been disabled for many months, and had been subject to attacks of general nervousness which, I believe, were of hysterical character, although the evidences of hysteria were in great part wanting.

Another case was in the person of a colored man, who was caught by an express train on a railroad, and was found on the engine some miles below where he had been struck, totally unconscious; a condition out of which he did not emerge for five days. For two months he was confined to bed. I first saw him about a year later. He complained especially of pains in the right shoulder, and in the right side of the breast, positions at which, from the scars, he had evidently been struck; also of coldness and numbness, especially affecting the right hand; also of attacks of violent headache lasting for several days, of ringing in the ears, and of disturbed sleep. He was unable to work more than a part of a day, and then would be laid up for some days. His station was good. There was marked deafness in the right ear. The knee-jerks were sluggish in the left leg and exaggerated in the right leg; the difference being marked. The right hand gave a dynamometer grip of 95; the left of 125. On stripping him, a distinct lumbar curve was found towards the left; the back was tender to pressure along its whole length, especially to deep pressure, which produced, at the same time, violent contraction of the erector-spinae muscles. In the right arm sensation was affected, so that he could not fix the position touched upon the arm within three or four inches; but to the æsthesiometrical points his answers were so wild that nothing could be made out of them. Movements of the trunk laterally or forward caused pain and spasm of the muscles, so that there was distinct rigidity.

Mrs. O. was another railroad case, who, fourteen months before I saw her, woke to consciousness in her own house some hours after having been struck by a locomotive. Previously she had been a very strong, powerful woman, the wife of a Bohemian laborer, sharing the hardships of his life, and bearing him many children. Since the accident she has been utterly unable to do any housework. She suffered from irregular, interrupted sleep, constant ringing in the ears, and frequent headaches; with pain in the small of the back, also in the sides and down the legs, greatly increased by exertion. Stripping her revealed a distinct lateral curvature in the back, with pronounced hyperæsthesia; and also excessive pain on deep pressure and on move-

ments, with spasm of the muscles of the back, and consequent spinal rigidity. The knee-jerks were rather sluggish; sexual power had been almost lost on account of the pain produced by the act; and frequent micturition at night evinced the general irritability of the nervous centres. The grip of the right hand was 15, and that of the left hand was 55.

An extraordinary symptom in this case, which was noted repeatedly both by Dr. Dercum and myself, was that when the woman was stripped in a very warm room, so that cold had nothing to do with the phenomenon, exertion would produce a violent "goose-flesh" over the whole body. Apparently whenever she made any exertion there was an overflow of nervous energy so excessive as to expend itself upon those muscles which usually are not influenced by volition.

You see, gentlemen, how similar are the symptoms in these cases to those I have shown you in the builder now before us. I might readily continue to quote from my note-books; the hour is waning, but I cannot forbear one more case, because I have been able to follow the man for nearly three years, and for between one and two years after the legal questions were settled, and because doubt was thrown upon my original opinion as to the seriousness of the man's trouble. In April, 1886, he fell down a hatchway, with result of a violent injury to the right knee, which confined him to bed and to the house for many months, he being all the time under careful surgical treatment. From the time of the injury he complained continually of pains in the shoulder and back of the neck. About a year after he was hurt he took a position for a short time in some sedentary occupation requiring little or no exercise, but was unable to hold it. In September, 1887, he had an attack of some kind of convulsion or convulsive movements, in which, it was stated, there was no loss of consciousness, but which was followed by maniacal symptoms, lasting for two or three weeks. Before this there had long been insomnia with headaches. He was seen a little later than this by Prof. Osler, who told me that when he saw him there was marked hyperæsthesia of the left side of the face; that violent twitchings of the face were produced by twisting the head, and soon spread all over the body; that he thought the man was suffering from hysteria. When I saw the man, in 1887, he was pale, very nervous-looking, had marked tremors of the hands, with distinct wasting of the right leg, evidently a result of the local injury which he had suffered to the knee. In the left leg there was distinct exaggeration of the knee-jerk and ankle-clonus. Baring the back, I found that pressure upon it produced violent pain and spasms of the back muscle. My notes upon



January 25, 1889, show that at that time Mr. P. was distinctly feeble, and incapable of any bodily or mental exertion ; that he walked with a tottering, irregular gait ; that there was great tenderness of the back, with pain on movements, and marked rigidity and spasm of the muscles on pressure or movement. Then there was also weakness of the muscles of the back, so that in getting out of a chair he almost raised himself up with his hands, and in raising himself up from a stooping posture he climbed up from his thighs, in a manner almost characteristic of certain paralyses in children. The knee-jerks were exaggerated, and there was a distinct loss of sensibility in the legs.

Shortly after the date last mentioned the legal proceedings in the case culminated in an award of damages, and at the suggestion of his medical advisers Mr. P. went to Vineland and lived carefully according to rule. After much trouble I succeeded in getting him to come to my office, March 5, 1890. He had been living very quietly, abstaining from every care, amusing himself with the occupation of raising chickens. When he came into my office, he affirmed that he was comparatively well, and that he had gained twenty pounds of flesh ; but when I came to examine him, I noticed that all of the old symptoms remained. He was unable to get out of a chair without raising himself by his arms and hands, and the attempt which he made to get up as an ordinary man does caused intense paralyzing pain in his back. There were pronounced tremors in his face, and all the time he was talking with me there were distinct choreic twitchings in his forehead and eyes, in his hands and fingers. When I told him to cross his legs, for the purpose of testing his knee-jerks, he raised his leg with his hand. His knee-jerks, though present, were much more sluggish than formerly. His gait was halting, staggering ; with folded arms it was impossible for him to get up off the floor, and when he did rise, he climbed up on his thighs, hand over hand, in the old method. When I bared his back, I found it just as tender as three years before, while the muscles, especially in the lower part, were distinctly wasted. I noticed that when he stood, his shoulders were always bent, and his head thrown forward, and on questioning him, he affirmed that in this position he was most comfortable, and that straightening up caused great pain in the back. Quick movements also caused this pain, which seemed to be more or less present all the time. Although he appeared to be so cheerful, and stated that he was so much better, close questioning showed that he was still very emotional, and that he frequently had hysterical crying spells, after which there would be large emissions of urine.

Gentlemen, you will remember that this last examination was made four years after his injury, and considerably more than a year after the jury had awarded him his damages, and his case had been entirely settled from the legal point of view. Take these histories in conjunction with the man whom you see before you, and in conjunction with the fact that I have never as yet known but one of these cases in which a thoroughly complete recovery was made, and you have, I think, sufficient answer for those railroad surgeons who would make us believe that the symptoms in these men are feigned, or merely hysterical, to be cured with rapidity and certainty by golden salve spread upon their injuries by a sympathetic jury.



# Ophthalmology.

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## LAMELLAR CATARACT; HEMORRHAGE INTO THE VITREOUS HUMOR; SUBCONJUNCTIVAL EC- CHYMOSIS; HYPERMETROPIA WITH ASTHENOPIA; PHLYCTENULAR KERATITIS.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

BY DAVID WEBSTER, M.D.,

Professor of Ophthalmology in the New York Polyclinic ; Surgeon to the Manhattan  
Eye and Ear Hospital, New York.

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### LAMELLAR CATARACT.

GENTLEMEN,—This first case is that of a woman forty-five years of age. The case is one of lamellar cataract. Like all lamellar cataracts this is congenital,—the woman was born with it. She sees probably as well now as she has seen all her life. Examination shows the cataract very well marked in the left eye. When the patient looks up or down, to the right or to the left, you see a clear peripheral portion of the pupil, but there is a dark shade in the central area. In the right eye I could not certainly detect the cataract until I had used cocaine and dilated the pupil, when a delicate dark shade appeared in the centre of the lens. The vision is, R. E.  $\frac{20}{40}$ , L. E.  $\frac{20}{70}$ .

Lamellar cataract, like all other cataracts, is an opacity of the crystalline lens. In the ordinary senile cataract in condition for operation the opacity involves the whole lens. This is true both of congenital and acquired cataract, and whether senile, traumatic, soft, or hard. The perception of light is good in all directions if the retina be good and the optic nerve unaffected. The patient, placed in a dark room, can see a candle or other light in any possible position in which the rays from it can strike the eye. If the perception of light be absent from any portion of the field, the prognosis is bad ; not much is gained by operation. If only the periphery of the lens be opaque, it does not interfere much with sight. This form of cataract is present in the eyes

of almost all old people. One would suspect that it is this form of cataract which is cured by massage, electricity, instillation, etc. Several years ago a regular practitioner reported a large number of cases cured by electricity. He published the name of one of the patients cured, and stated that Dr. Agnew and myself had made the diagnosis of cataract. On looking at the record I found that it was a diagnosis of this form of cataract with perfect vision of  $\frac{20}{20}$ . The patient read Jaeger No. 1 at the ordinary distance. I wrote and asked her to allow me to examine her eyes, and she readily consented. I went to her house and found a peripheral opacity, the same as that present before she was "cured." No doubt all were honest in making the report. The patient no doubt told how much difficulty she had in seeing, and that Drs. Agnew and Webster had diagnosticated cataract. The doctor used electricity for weeks or months perhaps, and electricity is, as you know, a good tonic; it tones up the muscles and improves the general health. The patient did see more comfortably, and the doctor supposed that she was cured. The patient herself thought that her cataract had been removed.

I cannot tell just how much resemblance the cases cured by massage and instillation may have to this case. Dr. Kalish has, as you know, reported from twenty to thirty cases cured by massage and instillation. Dr. Kalish is one of the officers of the Academy of Medicine; he gives the details of his cases and is willing to impart his information,—is, indeed, anxious to instruct every one in this method for the removal of cataract. I therefore asked Dr. Black, the house-surgeon of the Manhattan Eye and Ear Hospital, to look into the matter. Dr. Kalish instructed Dr. Black, who went to work with the massage and instillation treatment upon a patient whose vision was at that time  $\frac{20}{50}$  in both eyes. The treatment had been continued only about a week when I was surprised by the report that the patient was practically blind in one eye. There was complete opacity of the lens; the cataract had suddenly ripened. Of course this may have been a coincidence; I have myself seen cataracts ripen suddenly, but I would prefer not to have them mature so rapidly under treatment calculated to clear them up.

In the case before you the opacity is confined to one or more of the lamellæ of the crystalline lens in the left eye; where the greatest obscuration of vision is found, one or more of the lamellæ of the lens are opaque; all the rest of the lens within these layers and outside of them is perfectly transparent. In the other eye possibly not more than one lamella is affected.



We shall now test the vision, and we find—

L. V.  $\frac{15}{200}$  ;  $\frac{20}{70}$  with — 4 D.

R. V.  $\frac{20}{70}$  ;  $\frac{20}{50}$  with — 1 D.

The sight is in both eyes too good to be spoiled. If we were to do anything by operation we might leave the eyes in a worse condition than now. We shall not therefore do anything for the cataract until the lenses are much worse than at present. Sometimes lamellar cataract remains stationary, the area of opacity neither increases nor diminishes. In some cases as old age comes on the opacity extends so as to interfere with vision and make operation necessary, by needling, and, if this does not cause absorption, by extraction.

#### HEMORRHAGE INTO THE VITREOUS HUMOR.

The second case is that of a man forty-five years old, a clerk, married. This is a case of unusual interest, and a case which I don't myself fully understand. The patient presented himself April 11, 1890, stating that three and a half years ago he first had trouble in his right eye. The sight became blurred. At the end of three weeks he went to Dr. Knapp, and after four months' treatment his vision became about normal. Three months later vision again failed; he was treated again for three months, and again with a good result. By Christmas, 1889, his vision was better than at any time since the first attack. Five weeks ago the blur reappeared, worse than ever before. Examination, April 11, 1890, showed in the right eye no perception of objects,—a good field of vision but no reflex from the fundus. With the ophthalmoscope everything was dark. In the left eye vision was perfect. The patient never had had malaria, syphilis, or rheumatism. The condition improved under treatment. On February 11, 1891, however, he again returned as first seen. I do not remember in the course of all my ophthalmological experience ever to have previously seen such a case. The patient tells me that Dr. Knapp had seen only one other, that of a lady who was blind in both eyes; in her case, also, the blindness was transitory. This patient has an additional feature,—he had epistaxis at the time of the bleeding into the vitreous humor, for the case is evidently one of blindness from hemorrhage into the vitreous humor. Why hemorrhage from the right nostril is coincident with hemorrhage into the right eye I cannot say. The patient is fortunate in that he has at least one good eye. He tells me that he has also a tender spot on the right side of the cranium. He has evidently a disturbance of innervation and also undoubtedly changes in the walls of

the blood-vessels. He was previously treated at the Manhattan Hospital by the internal administration of the bichloride of mercury. We have him again under the same treatment, and he is beginning to improve,—he is beginning to see objects,—and I have the impression that with the ophthalmoscope we may now get a faint reflex from the fundus, but it will still be very much like looking through a key-hole into a dark room.

The patient is taking one-thirty-second of a grain of the bichloride of mercury three times a day. I am not certain, however, but that he would get well just as rapidly if we did nothing at all for him.

#### SUBCONJUNCTIVAL ECCHYMOSIS.

The next case is that of a woman, of middle age, with a subconjunctival ecchymosis. Such cases are quite alarming to the patient. The eye looks badly. The hemorrhage, however, never injures the sight; it is absorbed, leaving the eye as before. Our treatment, then, is simply to reassure the patient and to get rid of the blood as soon as possible. I think that bathing the eye in hot water with the lids closed a half-dozen times a day stimulates the capillaries and aids in absorption.

Hemorrhage from the conjunctival vessels may result from sneezing. It is most common, however, from whooping-cough. Persons sometimes notice the hemorrhage first on waking in the morning, and suppose that they have rubbed the eye in the night and have ruptured the blood-vessels in that way.

#### HYPERMETROPIA WITH ASTHENOPIA.

The next case is that of a woman, twenty-seven years of age, who complains that her eyes smart and burn, and that there is a good deal of pain across the brows. She has this pain pretty much all of the time whether she uses the eyes or not. These are symptoms of asthenopia or weak eyes. In such cases we put the patient through a complete examination. We test the vision, the refraction and accommodation of the eyes, and the insufficiency and the strength of the external ocular muscles. The examination is not, however, complete until we have used the ophthalmoscope, when we may still find something surprising. We may have an inflammation of the optic nerve, or a retinitis. There are plenty of diseases of the back of the eye and the optic nerve with no symptoms but those of asthenopia.

Examination shows here L. V. =  $\frac{2}{30}$  and a hypermetropia of 2 D., or one-eighteenth; R. V. =  $\frac{2}{20}$  and a hypermetropia of 1 D. The sight



of the left is not so good as that of the right. The patient gets a sharp image on the retina of the right eye; in the left eye it is blurred. The most generally accepted theory is that where there is a marked error of refraction with amblyopia in one eye only, the defect is congenital. Wherever there is a high degree of hypermetropia in one eye there is almost always amblyopia as well. There is no hyperphoria in this case; but there is esophoria of two degrees. With hypermetropia there is usually esophoria or exophoria,—that is, insufficiency of either the internal or external recti. Esophoria is most general in hypermetropia. When we correct the hypermetropia the esophoria is corrected, as a rule; tenotomy is not required. For any high degree of esophoria, however, we may require tenotomy as well as correction by glasses. To correct the hypermetropia here we shall require R. E. + 1 D. and L. E. + 2 D.

The patient complains of the glare. I never like to order glasses which are at the time uncomfortable. I prefer first to order those which are comfortable, and later to replace these by those which more nearly correct the errors of refraction. We shall, therefore, give this patient to-day R. E. + 0.75 D., L. E. + 0.2 D. She is to wear these glasses constantly, except when she goes to bed. In this way she will get the greatest possible good out of them. We expect to relieve the pain in and over the eye, and we shall ask her to return in a few weeks and report, when we may replace these glasses with stronger ones.

#### PHLYCTENULAR KERATITIS.

The next case is that of a baby referred to us by Dr. Gibney, of the orthopædic department of this college. The baby is under treatment for spinal trouble, and has been suffering with the eyes for three weeks. You notice first that the child draws away from the light, and that the lids of the left eye are red and swollen. When you have photophobia in a child of this age you immediately suspect phlyctenular keratitis, or at least some kind of keratitis. In the right eye we find an opacity of the cornea below the middle, showing that the child has before had phlyctenular disease, from which it has recovered. In the left eye there are active phlyctenules. We see many cases of this disease. All the local treatment needed, as a rule, is the following ointment:

R Yellow oxide of mercury, gr. ij;  
White vaseline, ʒj.—Mix.

Pull up the upper lid and put a portion of this ointment under it with the end of your index finger. Close the lids over it and then

thoroughly rub them, so as to disperse the ointment over the whole conjunctival sac. Do this twice a day, and the majority of cases will get well.

In some cases, however, we must do more. We must cut off tea and coffee; we must put the patients on a bread-and-milk diet. We may need to give them a rhubarb, soda and ipecac mixture, or the syrup of the iodide of iron and cod-liver oil. Locally we may have to use atropine or eserine, or both, alternately. We may even have to divide the orbicular muscle at the external canthus to overcome the blepharospasm and photophobia. The first by the constant exclusion of light increases the latter, and so we have a vicious circle formed which results in hypertrophy of the orbicularis. Sometimes even cantholysis is not enough to overcome this tendency, and ether has to be administered and a speculum inserted once a day for five or ten minutes, so as to stretch the orbicularis and accustom the eye to light and air. Dr. Agnew reported such a case where, after eight or ten such applications, the child began to open her own eyes.



## MYCOTIC KERATITIS; FOUR CASES OF CATARACT, WITH SOME UNUSUAL RESULTS.

CLINICAL LECTURE DELIVERED AT ST. LUKE'S HOSPITAL, CHICAGO.

BY S. J. JONES, M.D., LL.D.,

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University (Chicago Medical College).

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### MYCOTIC KERATITIS.

GENTLEMEN,—The first patient that I present to you to-day is F. B., a resident of an adjoining State, aged forty, of exceptional natural vigor of constitution, but who is now in markedly impaired health, as a result of long-continued overwork, and suffering for the last three weeks, from severe mycotic keratitis of the left eye.

The cornea is of a low grade of vitality, because of imperfect nutrition. Therefore primary diseases of the cornea are frequent accompaniments of impaired health, and are often an index of the state of the general health of the patient. Recognition of that fact is important in ophthalmic therapeutics.

In this case two spots of opacity between the laminae of the cornea can be seen showing points of infection; but there is not sufficient pus to produce the condition designated as onyx. Of the origin of the disease nothing definite is known. He was under treatment at his home for three weeks prior to his arrival here. Of the treatment before he came here I know but little. He states that a solution of bichloride of mercury had been used in the eye. In addition to the pain from which he has suffered, which has been intense at times, there is, as is usual, great photophobia. Since his arrival puncture of the cornea has been made, by drilling with a broad cataract-needle, to evacuate the pus which had formed between the laminae, and a pressure-bandage was applied. The intra-ocular tension was so great, and the anterior chamber so deep, that I deemed it best to perforate the cornea. Some of the pus escaped externally, and some poste-

riorly into the anterior chamber, forming hypopyon, which is now visible. As is seen, the iris has become involved (iritis), and from this a portion of the pus has doubtless come. The present condition is also known as serpiginous ulceration of the cornea, an affection which seriously endangers the integrity of the organ,—a suppurating process being established between the laminae. It burrows more or less irregularly, producing destruction of tissue, and, even when controlled, leaving more or less cicatricial tissue that interferes with clearness of the cornea, and, if in front of the pupil, produces impairment of vision. In cicatrization irregular contraction of the cornea is apt to occur, changing the refraction of the eye. Because of the seat of the inflammation in this destructive process, it is difficult to reach it with local medication. Until spontaneous rupture, externally, occurs, or an opening is made artificially into the infected part, germicides avail little, and the cornea is liable to further injury.

In this case an effort has been made to improve the state of the general health of the patient. The local treatment, in addition to puncture, has been the application of antiseptics, non-irritant in character. Should the pus not become absorbed, paracentesis of the cornea will probably become advisable to evacuate the pus from the anterior chamber. After paracentesis, washing out the anterior chamber with sterilized water, or a solution of boric acid, is advisable where the pus is thick and does not escape readily, or forceps may be required for removal of the accumulation.

The prognosis in this case, as in all such cases, must be at least guarded. So destructive has been the result in many instances that free incision of the cornea has been advised by Saemisch, whose name has been given to the operation. Iridectomy is sometimes advisable, especially where complicating iritis has caused occlusion of the pupil. The galvano-cautery is now used, and strongly advocated by some, the aim being to destroy the microbes, to permit escape of pus from between the laminae, and to secure removal of diseased tissue and early cicatrization. As a disinfectant a solution of peroxide of hydrogen has been advised. Long-continued inflammation of an eye, though that inflammation be of low grade, endangers the unaffected eye through sympathy,—a possible danger that should neither be overlooked nor disregarded. We seek, therefore, to control the disease of the affected eye, and to limit the destructive tendency in it, and, next, to avoid involvement of the other one.



## CATARACT.

I now present to you four cases of cataract manifesting different phases, two of them showing complications which may arise in operations for the relief of this condition, or follow previously successful operations.

The first, A. J., aged seventy, in impaired health, presented himself five months ago, when I extracted a well-matured senile cataract from the right eye. He made an exceptionally good recovery, and went back to his home about ten days later. He returned here a few days ago with vision nearly normal, in the absence of the lens. Slight opacity of the capsule of the lens remained, for which I performed a needle operation to lacerate it. Unusual reaction followed the operation, although antiseptic precautions had been taken. Iritis has supervened, and pus appears in the anterior chamber in this case also.

In explanation of the trouble, he states that, after the operation, he sat in a current of air in the hospital until chilled, which, with the fact of his impaired health and consequent diminished resisting power, was, doubtless, an important factor in producing his present condition, which seriously endangers the good result that had been obtained in the primary operation.

In cases of iritis, the chief reliance is upon atropia. Complications, such as have occurred in this case, are not anticipated, and must be met as they arise. In case atropia be not sufficient to relieve the intense pain, which usually accompanies the condition, and from which he is suffering, other anodynes must be administered to secure such relief. Vesication with cantharidal collodion in the eyebrow frequently relieves persistent supraorbital pain. Free use of hot water on the eyelids also relieves by depleting. If much pus accumulate, it may be necessary later to perform paracentesis of the cornea in this case, and to wash out the anterior chamber with an antiseptic solution, unirritating in character, as well as to apply an antiseptic dressing. Such severe inflammation of the iris is apt to be followed by plastic capsulitis as well, thus rendering the remains of the capsule thick, causing adhesions to the iris, called posterior synechia, and contraction of the artificial pupil. In fact, the parts become so changed and degenerated by continuance of the inflammation that subsequent operations to form a new and larger pupil are not only difficult, but, at times, only partially successful. The color of the iris frequently is permanently changed. In some cases the iris becomes convex anteriorly, because of pressure of the aqueous humor behind it, which cannot escape through

the pupil into the anterior chamber. Such pressure, long continued, produces thinning of the iris tissue, and causes the pigment of the posterior surface to show through it. This condition has been mistaken, by persons unfamiliar with the pathological condition, for the development of melanosis, because of the color and the bulging of the iris.

It is too early, yet, to determine the issue of this case, but we look with suspicion on all such complications as have here developed, and especially when occurring in advanced life and impaired health.

The next case which I present is a similar one. A. C. is seventy years of age, and in fair health for his time of life. The left crystalline lens had been extracted by another surgeon, several months since. He also presented himself a few days ago for operation for opaque capsule of the lens. He was operated upon under the same circumstances, but, instead of being retained in the hospital, went immediately to his own home, being a resident of this city. Instead of obeying instructions to give his eye care for a few days after the operation, he continued to expose himself daily, regardless of the state of the weather, without any unfavorable result, thus showing the widely different results which may follow operations of like nature performed under apparently the same circumstances. He now requires merely the adjustment of proper glasses,—one power for reading and a lower power for seeing at a distance, but each to be placed in an accurately-fitting frame, for it is as important to have the frame suited to the wearer as it is to have the correct glasses prescribed. This fact is too often disregarded and injury to the eye results. Blue steel frames are, all things considered, the best. They can be of light weight, they do not reflect light enough to attract much attention or to be dazzling to the eye, and they keep their shape much better than gold frames.

The next patient that I present, J. C., is another case of senile cataract. He is in good health, and thirty-eight years of age. The cataract was more advanced in the left eye than in the right, and the operation on it, which was performed for the removal of the lens, was what is known as Von Graefe's modified linear extraction. Iridectomy was performed to facilitate the removal of the lens, which was large, and was extracted with some difficulty. The operation was performed one week ago. As you see, union of the flap has occurred; the eye is in good condition and there is fair vision already. The case has progressed without any untoward symptoms, and the patient is almost ready to return to his home, there to remain until the eye shall have quieted down from the removal of such important parts as a portion of the iris and the crystalline lens. Later, he will probably require a needle



operation, as in the two preceding cases, to lacerate the remains of the capsule of the crystalline lens, which will probably become opaque, as it generally does after these operations, because of interruption of its nutrition when thus disturbed. He will then be ready to be supplied with spectacles to compensate for the loss of the lens, a lower power being required for seeing at a distance, a higher power for reading and work at what is known as the near point. This difference in the power of the glasses is necessitated from the fact that the power of accommodation to different distances is lost when the crystalline lens is removed, as that power resides in the crystalline lens, and is produced by varying degrees of its convexity adapted to the direction of the rays of light entering the eye, whether divergent from a near point or parallel from a distance.

The next is also a case of double senile cataract. The patient is W. S. C., aged seventy-eight, in fair health for his time of life, on whom I operated the day following that upon which I operated upon the preceding patient.

This case also shows what an unexpected result may follow the same kind of an operation performed under the same circumstances as in the last case. In the operation upon this eye less difficulty was encountered in the removal of the lens, and at its close the prospect for a satisfactory result was unusually good. The customary precautions were taken to guard against infection, yet within forty-eight hours afterwards suppuration set in on the flap of the cornea. The probabilities are that sight will be lost. Apparently, the only explanation of the difference in the result in these two cases lies in the difference in the ages of the patients and the state of general health,—the operation having been performed in the same room, with the same instruments, under as nearly identical circumstances as was practicable. They have occupied rooms almost adjoining, with no greater danger from infection in one room than in the other. The one has made a satisfactory recovery, the other now presents the prospect of loss of the eye operated upon, while at the close of the operation the indications were equally favorable in the two cases. These results show how impracticable it is to give that positive assurance which patients often desire of the outcome of operations, however favorable the appearances may be at the time of operation.

The absence of pain is a noticeable feature in this case, and is an additional indication that the sloughing is largely due to malnutrition of the general system, rendering the blood-supply to the corneal flap less than usual, and less than was required for union. Conse-

quently prognosis is unfavorable, notwithstanding any course of treatment that might be resorted to beyond general support for the system by food and stimulants. Such a result as this follows much less frequently now with a smaller corneal flap than in the earlier days of extraction, when iridectomy was not performed and the flap was made to embrace nearly one-half of the cornea, thus greatly diminishing its nutrition, and consequently increasing the risk of necrosis.



# Otology.

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## NECROSIS AND EXFOLIATION OF THE TEMPORAL BONE.

A CLINICAL LECTURE DELIVERED AT THE UNIVERSITY OF PENNSYLVANIA.

BY B. ALEXANDER RANDALL, A.M., M.D.,

Clinical Professor of Otology in the University of Pennsylvania.

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GENTLEMEN,—Most of the cases presenting themselves in the course of aural practice require for their investigation and treatment the use of special apparatus and a minuteness of study which ill fits them for our purposes of demonstration to any considerable number of students. Such cases must form a considerable part of our future work together, because they are representative in character, they afford the opportunity of acquiring the methods of aural investigation and treatment, and they will also teach you, if you will rightly use them, a habit of close, attentive examination and a delicacy of manipulation, which you will find of value in many other branches of your work.

On this occasion, however, I wish to bring before you striking cases of severe disease of the ear, such as must at times come under your care; and in which not only the hearing, but also other important functions, and even life itself, are at stake. Two of these cases had gone beyond the stage of imperilled hearing—the organ was actually destroyed—when they first came under my care; and the question was how to save the seriously threatened life, how to preserve any vestige of the organ which may have escaped destruction, and how to abbreviate the tedious process of healing.

This first case, a boy of two years, was admitted to the Children's Hospital on November 9, with profuse discharge of fetid sanious pus from both auditory canals and from a sinus in the right mastoid just behind the auricle. There was the total paralysis of the right facial nerve which you see still exists, the face being drawn to the left even when at rest, but markedly so on movement, and the right eye remaining open through drooping of the lower lid in spite of all effort to

close it. Inspection and careful probing showed the presence of a large movable sequestrum on each side; and the larger of these two which I present was withdrawn from the mastoid sinus on the right, and the smaller was with difficulty dragged out through the canal on the left. This was done with great caution, under ether, and was possible only after the friable masses had been reduced in size by some crushing with the forceps. This caution I wish to emphasize especially; for while it belongs to all surgical procedures, it comes in as a very important limiting factor in aural surgery. It is safer to do a little less than the general surgical rules call for, rather than risk serious and irreparable mischief to the important structures which here surround our field of operation. After the removal of the sequestra, the cavities were thoroughly cleansed by syringing and sponging with the peroxide of hydrogen, the rough bare surfaces of bone were curetted in directions in which this was safe, and rubbed with the cotton-pledget elsewhere, in order to detach any remaining dead spicules and rub off flabby granulations, the parts were freely dusted with boric acid, and a light protective dressing applied. This has been frequently renewed, with prompt attainment of the result which you see, that all discharge has ceased on the left; while on the right the sinus has healed nicely and only a little pus can now be found on cleansing. Persistence of the facial paralysis, and inability to get the child to notice sounds not accompanied by decided palpable vibrations, make it very likely that the organs of hearing and the right facial nerve are irreparably destroyed.

In this second case, a man of thirty-five, there is a history of a severe head-injury a year or two ago, of doubtful bearing upon the labyrinthine necrosis. In the middle of December the right side of his face became suddenly paralyzed, and he had severe pain, high fever, and great dizziness. When he first came to the Polyclinic Hospital, cleansing away of the pus filling the canal showed the soft tissues at its bottom white, pulpy, and necrotic. On the following day I found the stapes loose in the canal and removed it intact. Soon the whole inner bony wall of the tympanic cavity was visible, bare and white, with the niche of the round window clearly recognizable; then the sequestrum began to show some mobility, and vigorous granulations appeared around it. These are now exuberant, and have forced their way in front of the mass of dead bone; so I have snared and cauterized them. These granulations are valuable aids in such cases; for, while the dead bone might remain for years unaffected by the pus which bathes it, the pressure of these living masses can rapidly disin-



tergate it, as well as lift it from its bed and bear it bodily outward. The man's condition has greatly improved and is less serious, although still far from satisfactory. His rest is little disturbed, his appetite is fair, and he can walk about alone, as he was before afraid to do. This lessening of his vertigo may mean either the relief of the irritative involvement of his semicircular canals or, on the other hand, the completion of their destruction. You know of the involvement of the labyrinth with deafness, usually of sudden onset, which is called "Ménière's disease": it is important to know that labyrinthine destruction generally ends any such symptoms. The tuning-fork gives doubtful evidence that any vestige of hearing remains on this side; the facial palsy shows no diminution; and it is altogether probable that the wreck of the labyrinth is complete and permanent. The sequestrum will perhaps show us, when it comes away, just how extensive the destruction has been; and may, like this one which was removed from a child affected like our first patient, show the remains of the facial canal, of the horizontal semicircular canal, and of other aural structures. Surgical intervention may soon enable us to shorten the tardy progress of his case by removing this necrotic mass; but the general surgical rule of waiting until demarcation is complete, here needs to be extended to the time when the sequestrum has become well loosened. The specimen which I have just shown you was removed by my resident some years ago, who had looked on impatiently at the cautious efforts which I made during two weeks to loosen it. His satisfaction seemed much alloyed when he saw how large a portion of the meninges and of the lateral sinus had been laid bare by its removal, and that the jagged anterior end must have done some dangerous scratching of the walls of the carotid and of the head of the jugular; and he seemed to think, as I do in this case as well as that, that discretion may be the better part of valor. The carotid can be tied or the lateral sinus tamponed, if need be; fatal hemorrhage from the ear is decidedly rare: yet it is a satisfaction to me that the only case of the kind that has occurred in my practice was not due to meddling interference on my part. Not only will the great blood-vessels be imperiled in extracting the sequestrum in our present case, but also any remaining portion of the labyrinth; and so, as long as the discharge is uninterrupted and the granulations can be controlled, I shall treat the case expectantly. Scrupulous cleansing daily, with insufflation of boric powder, will probably suffice to keep the ear safe, while nature does that share of the work in which she is unequalled for conservative delicacy.

In this little girl we have a notable example of the later stages of a condition of this sort. She had long-standing purulent discharge from her left ear, probably neglected, as such conditions often are, with the expectation that it would prove of little importance and cease of itself. A mastoid abscess formed, after some exposure and cold-taking in all likelihood, and a large opening behind the auricle gave exit to copious purulent discharge and necrotic masses of bone; and now, after months, you see a huge cavity occupying the entire mastoid and looking larger than you would have supposed could exist within the temporal bone. The tympanic cavity, the antrum, and all the cells of the mastoid have been thrown into one by the breaking down of all septa; and the probe carried in through the auditory canal is seen from the posterior opening to lie near the deepest portion of the cavity. Nearly the whole lining is dry, smooth, and cutaneous, though thin and evidently cicatricial; only at the anterior, deepest part, which is really the entrance to the Eustachian tube, is the surface moist, reddish, and granular. Soon this will be dry and quiet, and the healing will be complete. In marked contrast to the preceding cases, you note that we have here no facial paralysis, and inquiry fails to bring out a history of even a transient lesion of that kind. I call attention to this, because a fleeting palsy of the facial nerve not very infrequently accompanies an acute inflammation of the middle ear, and is due to involvement of the nerve where it passes (at times uncovered through incompleteness of its canal) in the median wall of the tympanum. Sometimes the palsy outlasts the tympanic affection; and the lesion is ascribed to rheumatic involvement at the stylo-mastoid foramen, the tympanic trouble being unrecognized. Examination of these preparations will show you the close relation of the facial canal to the tympanic structures; and turning from them to our little patient again, it must seem marvellous that such extensive destruction in this region could have spared these and other important structures. What delicacy of surgical intervention could have accomplished this as safely? The tuning-fork shows us that hearing is preserved to some extent upon this side; and, while this vestige is of relatively little value so long as she enjoys normal hearing with the other ear, it may some day be very valuable to her, should any misfortune befall her good ear. Quite a loss of substance remains, and the sinus behind the ear is a slight deformity; but any attempt to close it up would probably be fruitless except at the surface, and would be undesirable there, since the products of desquamation would collect within the cavity, and might become a source of renewed danger.



Still more favorable is the result in this little boy, who was brought to me a year ago with a mastoid abscess, the outcome of a suppuration following measles. Free incision through the greatly swollen tissues of the mastoid, which pushed the auricle far out from the head in a characteristic manner, evacuated a large quantity of horribly fetid pus, and revealed necrotic portions of the outer table of the mastoid. Syringing passed through into the auditory meatus with fair freedom, a result not always to be obtained, but very desirable in the interest of thorough cleansing. His progress towards recovery was discouragingly slow, and was several times interrupted by relapses; so that several other cases treated at the same time had fully healed before he had made any considerable advance. As soon as demarcation and loosening of the necrotic bone were at all distinct, the sinus was thoroughly curetted, removing all dead bone and flabby granulations as far as the antrum, and leaving a large gaping opening behind the ear. This has now closed, as you see, although it was almost as large as the unclosed cavity in the preceding case; and you can distinctly feel the cord-like fibrous cicatrix which fills it. The tympanum is now dry, with a considerable perforation in the posterior part of the drum-membrane; and the granulations within are shrunken, flat, and almost perfectly dry. There has been no sensible discharge for about six weeks, the hearing is apparently normal, and, although I wish to see the opening in the drum-membrane close as the final step in the healing process, the case may be considered as cured.

We have thus seen four phases of this important and serious disease, each of which has imperilled the life of the patient, abolished for a time at least the hearing, entailed a considerable deformity through palsy of the face, which also leaves the eye exposed rather dangerously in two of them, and has necessitated tedious, painstaking cleansing and watching through a duration of many months. The gravity of these cases can hardly remain in doubt with you; and I trust that the lesson taught by the worse and irreparable instances will save you from the mistake of disregarding or neglecting the suppurations of the middle ear, which are almost always the starting-points of such affections. Their recognition is usually easy; and their treatment is the simple, conservative application of general surgical principles,—the evacuation of pus, drainage, scrupulous cleansing away of secretion, necrotic fragments, or unhealthy granulations, in order to avoid sepsis, and judicious use of measures to support your patient through the trying and sometimes exhausting course of the disease. This ought usually to be easy to every one of you as general practitioners; and the specialist ought

but rarely to meet the neglected and hopeless cases which now come to him only in time to constitute the major part of his death-list. There are doubtless mysteries and difficulties in otology, as there are in all parts of medical practice ; but they are rarely too great for the practitioner who, instead of assuming that they are beyond his comprehension, and therefore to be struck at desperately with closed eyes, studies them coolly, and applies to their treatment the plain rules of surgical common-sense.



# Laryngology.

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## MULTIPLE PAPILLOMA OF THE LARYNX IN YOUNG CHILDREN, AND ITS TREATMENT.

CLINICAL LECTURE DELIVERED AT THE DARTMOUTH MEDICAL COLLEGE.

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GENTLEMEN,—We come to-day to the consideration of a disease occasionally met in infancy and early childhood that mechanically obstructs the breathing, and unless recognized and treated in time destroys life by suffocation.

This affection has its seat on the vocal cords and walls of the larynx, and is characterized by soft, whitish, multiple, and often rapidly-growing, warty growths called papillomata. It may sound like an extraordinary statement, but I believe I am correct in making it, that prior to the year 1850 all the children who were the subjects of this complaint died from asphyxiation, without having had any rational treatment and without even the nature of their trouble being suspected. Happily, the number was not large, as the disease is a very rare one.

After what we learned the other day about the laryngoscope and its uses, you will naturally ask yourselves why, if these patients had symptoms referable to the larynx, some one did not look into that organ and find out if anything was wrong there. But it should be remembered that the laryngoscope was not invented until 1858. It was in the ante-laryngoscopic days, therefore, that these children fell victims to an undiscovered and unsuspected disease. And this leads me to say that one of the happiest triumphs of laryngoscopy is that it enables us to discover foreign growths in the air-passages which, if not discovered and treated, may eventually cause death. It is odd, indeed,

nowadays to read of cases like the following: Pelletan, a surgeon who lived in the early part of this century, lost a patient of from thirty to forty years of age by suffocation. The autopsy showed that the larynx was blocked by a solid tumor. Pelletan remarks that "the cause of the accident could neither be known nor attacked; dissection alone could reveal it." In these days the laryngoscopic mirror would make everything clear to us. But in infants and young children who are rebellious, we find obstacles that render a laryngoscopic examination impossible, because the co-operation of the patient is necessary to make such an examination thoroughly satisfactory. How, then, are we to manage with very young or unruly children? I shall speak of this fully when I come to the treatment of the affection. I will merely say here that, after giving you the clinical picture of multiple papilloma of the larynx, the two points I wish to impress upon your minds are: first, the practicability of examining young children with the laryngoscope when they are anæsthetized, and, second, the feasibility of operating upon them under ether in the manner employed in the adult without ether. I shall now call your attention to the histories of four typical cases of this affection that have come under my observation.

CASE I.—G. E. C. D., a boy, aged five years, was first brought by his mother to the Throat Department of the Massachusetts General Hospital, on October 22, 1888. He had been "croupy" since he was two years old. When he was three years of age he began to grow hoarse. The hoarseness steadily increased, until for the space of a year he had been unable to speak above a low whisper. There was no pain, but considerable dyspnœa on exertion, and at night his breathing was heavy and labored. His mother thought he breathed better at the time of consultation than he did four months previously. Nine months before his visit he had bronchitis which lasted two months.

This child being very docile, and having a spacious pharynx for his age, a laryngoscopic examination was effected with ease, and revealed whitish, papillomatous masses lining the walls of the larynx. The larynx was not so completely filled by the growths as to prevent easy breathing during the day, unless the child made some exertion. He was not seen again until November 30. Meantime he had had an attack of jaundice, and after that there had been more difficulty in breathing. The respiration was now noisy by day, and still worse by night. For the past week he had awoke every night oppressed for breath and was unable to breathe for a few seconds.



The laryngoscope showed that the growths had increased during the interval. They were attached to both walls of the larynx and reached to the level of the ary-epiglottic folds. It was, of course, impossible to determine how deep was their attachment downward.

Although the child submitted readily to laryngoscopic examination, he rebelled against every attempt at any operative measure through the mouth.

Tracheotomy was advised, and he was admitted to the hospital in the service of Dr. J. C. Warren.

During the night of December 2 the child had two coughing spells, breathed hard, and became cyanosed, but was relieved by hot applications to the neck. The next day, December 3, the dyspnœa became much more urgent, the sternum being sucked in with each inspiration, with recession of the soft parts above the clavicles. Tracheotomy under ether was performed by Dr. Warren, just below the cricoid cartilage. Four days later the stitches were removed. There was very little trouble, with the exception of a slight muco-purulent discharge through the tube. The child was now breathing freely through the tracheotomy-tube. This measure, it must be understood, was merely temporary and palliative, and the question now arose as to the proper means by which the obstructing growths in the larynx could be removed. The usual procedure in similar cases would be to perform thyrotomy and then cut or scrape away the growths from the interior of the larynx, an operation not very dangerous in itself, but apt to lead to serious complications, such as stricture of the larynx and permanent impairment of the voice.

I explained to Dr. Warren a method I wished to try for the first time, as a substitute for thyrotomy, and by his courtesy the child was placed in my care. I waited for a day when the sun should shine brightly, which occurred on December 12, and then, in one sitting that lasted about an hour, the large papillomatous mass that you see here in this vial was removed through the mouth by the following methods: The child was thoroughly etherized, and was then seated upright in the lap of a nurse. The mouth was held open by a gag. The tongue was pulled gently forward and held by an assistant. The sunlight was then reflected into the pharynx, and with a small-sized laryngoscopic mirror I was enabled to obtain a perfect view of the interior of the larynx, all secretion having been previously wiped away. Then by means of the mirror, seeing perfectly what I was about, I proceeded to remove the growths in the manner customarily adopted with adults not under the influence of an anæsthetic. The instruments used

were the laryngeal forceps and curette. Each instrument was introduced many times, and small pieces of the papilloma were successfully brought away until the larynx was free. The growths were found to be attached to the lateral and anterior walls of the larynx, to the ventricles, to the vocal cords, and to the sides of the trachea just below the vocal cords. The hemorrhage was slight, and no reaction followed the operation.

The next day, December 13, a cork was placed in the tracheal opening and the child breathed freely through the natural channels. On December 14 the tracheotomy-tube was removed, and the opening in the neck closed. On December 16 the tracheal opening healed. On the 18th he was discharged from the hospital, breathing naturally, and being able to speak in a loud whisper.

This child has since been seen at intervals, in the out-patient department, but no treatment of any nature has been directed to the larynx.

One of the characteristics of this form of growth is its tendency to recur. In this case a recurrence was detected in July, 1889, when a small nodule was seen on the left ventricular band, and a short time later the ventricular band on the opposite side also became involved. The growth increased for a time, but in January, 1890, it had perceptibly diminished, and the voice had greatly improved. This child was last examined in April, 1891, two years and four months after the operation. His general condition was excellent, and the breathing quite natural. The voice had gained in strength, but was still hoarse. The laryngoscopic examination showed that the interior of the larynx, to a point below the vocal cords, was rough, and here and there were noticed small nodules of the growth, the larger portions being on the lateral walls in the region of the ventricular bands. Unless the growth should again show a tendency to disappear spontaneously (which is not likely) attempts will be made to remove the remaining portions with a curette through the mouth. The child is now so much older that he may prove more tractable to intralaryngeal operations; if, however, he should not submit, he will again be etherized and operated on as before, but without a preliminary tracheotomy being performed.

CASE II.—H. C. W., male, aged five, was referred to me at the Boston City Hospital by Dr. Charles W. Haddock, of Peabody, Mass., on May 13, 1889. The child was well nourished, and with the exception of the condition of his larynx was a perfectly healthy boy. In the past year he had been steadily growing hoarse, which began with an attack of whooping-cough, and when first seen he was practically



aphonic. He had considerable dyspnœa on exertion, and at night had great difficulty in breathing.

The child was very tractable, and his confidence was easily gained, and a laryngoscopic examination was made at his first visit. It revealed a large whitish growth attached to the anterior wall of the larynx, between and above the vocal cords, and filling up about three-quarters of the lumen of the glottis. With forced respiration the growth moved up and down.

All attempts to remove it in the customary manner through the mouth having failed, on June 27 the child was etherized, and, with the assistance of Dr. J. Payson Clark, I operated by means of the laryngoscope, the patient being seated upright in the lap of a nurse, as described in Case I. In this instance, however, the patient was not tracheotomized, which greatly added to the difficulty and danger of the operation, a point to which I shall again refer. The child took ether perfectly, there was no sign of spasm of the glottis, very little secretion, and no hemorrhage at all alarming. Two days after the operation the child was again examined, and a small portion of the growth was seen remaining between the angle of the vocal cords. The breathing had become normal at night, and he was able to speak in a hoarse voice. He was not seen again until December, 1889. The growth between the vocal cords had increased in size. This was removed by the curette in the ordinary way, the patient having become much more tolerant of the intralaryngeal procedure.

In response to my call the child came to see me on April 22, 1891. There had been no return of the growth. His health is perfect. His voice has steadily improved and is now very good, indeed, although slightly muffled, owing to the anterior portions of the vocal cords being still a little thickened.

CASE III.—E. D., a negro child, aged five, was first seen at the Massachusetts General Hospital, November 14, 1889. His history closely resembled that of Case II. His symptoms were difficult breathing and aphonia. He began to grow hoarse one year previously, and this had steadily increased until, when seen, his voice was a very low whisper, and it was with difficulty that he could be induced to utter any sound at all. His breathing, when awake, unless he made some exertion, was good, but at night it was distressingly labored, and some one was obliged to sit up with him for fear of suffocation. He was strong, well nourished, obstinate, and exceedingly difficult to examine with the laryngoscope. A perfect view, however, was finally obtained, and a large papillomatous mass was seen filling up the

laryngeal cavity. It appeared to be one distinct tumor, attached to the right side of the larynx.

On November 26, preparations having been made for tracheotomy, in case it should be necessary, the child was etherized, seated upright in the nurse's lap in the sunlight, and with the aid of the laryngoscope I proceeded to remove the growth.

The instruments used were the laryngeal snare, Schrötter's tube, forceps, and the curette. The operation lasted one hour and a quarter. The larger portion of the growth was taken away with the snare; the bleeding was insignificant, and during the process of etherization and the operation there was not the slightest indication for the performance of tracheotomy.

Examination ten days after the operation showed that a little of the growth still remained on the anterior portion of the right side of the larynx, apparently springing from the ventricle. The breathing, by day and by night, had become perfectly normal. The voice was very good, but hoarse.

The child was not seen again for more than a year, when it was found that the right side of the larynx and the right vocal cord were perfectly healthy. The left ventricular band, however, is now occupied by the growth, which prevents the left cord from being seen. There is also a good-sized nodule attached to the anterior wall of the larynx, just under the right vocal cord, which moves freely with respiration. The voice is very good indeed, but husky. The breathing is unobstructed, and the child is perfectly healthy. Since he was last examined he has become most tractable, and the laryngoscopic examination was effected as easily as on the adult. Another operation will be necessary in this case.

CASE IV.—I am indebted to the surgical records of the Massachusetts General Hospital for the early history of this child, and to the kindness of Dr. C. B. Porter for placing him under my care the second time he was admitted to the hospital.

E. K., male, aged two years, first came to the out-patient department of the Massachusetts General Hospital, May 14, 1889. He was strong and healthy. He began to talk at the usual age, and could say a few words plainly. About three or four months ago a slight huskiness was noticed in the voice, which grew rapidly worse, and for the past two months the voice has been lost entirely. Since then the respiration has been very difficult and labored. He was seen by Drs. F. I. Knight and S. W. Langmaid, and recommended to the hospital for tracheotomy. He entered with labored breathing and loud whizzing



sound with each respiration; depression of epigastrium and supraclavicular spaces very marked. He could make no sound, either of talking or crying.

The patient was tracheotomized by Dr. J. W. Elliot. The operation was performed without any especial difficulty, and was followed by great relief to the breathing. The child did well until six days after the operation, when he came down with an attack of measles. This proved to be mild, and soon subsided. He was discharged in excellent condition on June 6, as there was a case of diphtheria in the ward. The tube was still in, and he was told to return. He was not seen again until December 3, 1890, one year and seven months after being tracheotomized. He was brought back on account of difficult breathing. The tube was found to be in good position; it could be easily removed and easily put back. With the tube out, the child inhaled perfectly through the mouth, but exhaled through the tube-hole.

It was impossible for him to breathe with the tracheal opening closed. Owing to the child's bad temper, all attempts to examine him with the laryngoscope were useless. Accordingly, on January 7, 1891, he was etherized solely for diagnostic purposes, and with the sunlight a perfectly satisfactory laryngoscopic examination was made. He was held upright in the nurse's lap, the mucus in the pharynx wiped away, the mouth held open by a gag, and, the pharynx being spacious for such a young child, a perfect view of the interior of the larynx was obtained, a small-sized rhinoscopic mirror being used. The cause of the difficulty was at once apparent. The larynx was seen to be completely blocked by a whitish papillomatous mass attached to the anterior and lateral walls. On January 15 he was again placed under ether, and, with the laryngoscope, in the manner described in the previous cases, I removed the growths. The operation, in which I was assisted by Dr. J. P. Clark and Dr. F. C. Cobb, lasted one hour. The instruments used were the laryngeal forceps and the curette. The papilloma was exceedingly soft, and the bleeding was not at all troublesome. On January 16 the temperature was normal and the general condition excellent. On January 17 a cork was placed in the tracheotomy tube and retained there for some time, the child breathing perfectly through the natural channels. The tube was removed and the tracheal opening closed with plaster. On January 20 the opening in the neck had healed, he breathed naturally, his voice could be heard across the ward, and he was improving daily. The child remained in the hospital until February 23, when he was discharged in excellent condition.

The salient symptoms common to all the cases related above, as will have been noticed, pertain to the alteration in the tone of the voice and to the difficulty in breathing. In all similar cases the history will be the same. It is rare for these growths to be congenital, yet there are a few instances recorded. It is usually at about the first, second, or third year that the symptoms begin to manifest themselves, and the first thing noticed is that the child is hoarse. This, however, instead of passing off in a few days, as is usually the case, persists and constantly grows worse, until the voice is reduced to a low whisper or even, as in Case IV., no sound whatever can be made.

The next symptom to make its appearance is a difficulty in breathing. This comes on at varying intervals, according to the case, sometimes in a few months, and sometimes not for years after the first alteration in the voice. It is at night, while the child is asleep, that the labored breathing first manifests itself. During the day the child may be running about and playing, the picture of health, and breathing freely, but as soon as he falls asleep, the will-power being gone, the parts become relaxed and the respiration labored and noisy. As time goes on and the growths increase in size, the breathing by day becomes difficult, especially when any exertion is made. If the child is at rest, the breathing may not attract attention as being abnormal, and yet the larynx may be nearly filled by the growths. Do not allow yourselves to be deceived and caught napping by this peculiarity of the breathing. It is remarkable how easy the breathing may be when there is almost complete occlusion of the larynx, provided the individual be awake and not making any effort. Be on your guard, therefore, in respect to this insidious symptom. Suspect papillomata of the larynx when you meet with these sturdy, healthy-looking children who have a history of long-continued, labored breathing, and hoarseness or loss of voice.

Other symptoms which may be present are cough, rarely trouble in swallowing, and pain. You will have remarked that all the cases I have reported were boys. This affection is much more frequent in males than in females. Causit,<sup>1</sup> who has written a most complete monograph on the subject, estimates the predominance of males over females, attacked by this disease, to be in the proportion of twenty-eight to fourteen. It is difficult—in fact, at present it is impossible—to say what causes this affection in children. Diphtheria, croup, measles, and whooping-cough are said to be predisposing factors. The children who came under my observation were robust, vigorous, and

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<sup>1</sup> Étude sur les Polypes du Larynx, Paris, 1867.



healthy-looking boys, sound in every organ with the exception of this local growth in the larynx.

Authors, such as Ehrmann, Horace Green, and Sir Morell Mackenzie, who have written well-known works on the subject of growths in the larynx, are of the opinion that any prolonged irritation may lead to the formation of these pathological products. Our New England climate occasions much irritation and chronic congestion in various portions of the air-tract in the larger proportion of the inhabitants, yet papilloma of the larynx is, fortunately, seldom met with, and the fact that it may be congenital leads me to think that its most important etiological factor is unknown.

We come now to the practical questions of diagnosis and treatment.

Ehrmann, who lived before the invention of the laryngoscope, said that there was but one certain sign of the existence of this disease,—viz., the discharge by expectoration of some portions of the tumor. We can now affirm that the one certain method of determining the presence of the growth is by employing the laryngoscopic mirror.

Provided we can gain the confidence of young children, laryngoscopic examinations can be easily made on them; otherwise they are impossible. In Case IV., detailed above, the child fought, kicked, and vomited at every attempt made to examine him, and nothing was ever effected with the laryngoscope until he was placed under ether. I would suggest that laryngoscopic examinations under ether should always be attempted for diagnostic purposes in unruly children. Such examinations are facilitated by using sunlight for illuminating purposes. Then, after wiping away all accumulations of mucus in the pharynx, a perfect view of the larynx can be obtained, especially if the child has ample space between the base of the tongue and the posterior pharyngeal wall.

Children vary greatly in this respect. They also vary greatly in the amount of secretion in the pharynx, which is the chief obstacle to these examinations under anæsthesia. But, so far as my experience goes, after the child is thoroughly etherized and the mucus once carefully wiped away, it is not again secreted rapidly enough or in sufficient quantity to hinder the examination.

The presence of the growths having been determined, their removal should be effected in one sitting under ether, according to the method described in Case I. That child, it will be remembered, had been previously tracheotomized, but in Cases II. and III. the growths were removed in the same manner without a preliminary tracheotomy. The

operation by this method, difficult under any circumstances, is greatly facilitated if tracheotomy has been previously performed. But it is well to avoid this operation if possible. Whether tracheotomy should be done or not must be decided by the urgency of the case in reference to the dyspnoea. If the growths occlude the larynx to such an extent as to cause labored and stridulous breathing by day when the child is not making any exertion, a preliminary tracheotomy should be done. If the breathing, however, is tolerably free, tracheotomy can be dispensed with. The admission of blood into the lungs is to be guarded against. In Cases II. and III., operated upon without tracheotomy, as soon as a portion of the growth was removed the child was reversed, and held with its head down to allow what blood there was to escape by the mouth. The bleeding in the cases reported was not profuse and not at all troublesome.

The instruments at our command to remove the growths are the forceps, the cold snare, and the curette. The selection of any particular instrument will depend upon each individual case. These papillomata are friable, and cover a large surface in a very narrow organ. The instrument that has given me the most satisfaction is the curette. This instrument was made for me by Codman & Shurtleff, of Boston, and consists of a solid back so shaped that when the growth is scraped off it is caught in the depression at the lower end of the curette and thereby prevented from dropping down the trachea. The instrument is attached to a shank having the Schrötter curve, and can be readily watched while it is being manipulated in the larynx. This is an especial advantage in young children, where the larynx is very small. When the growths have been cleared away no further treatment should be directed to the interior of the larynx. By this I mean to advise against cauterizing the seat of attachment of the growths in the hope of preventing their recurrence. You will find that the galvano-cautery, chromic acid, nitrate of silver, and other caustics, are recommended by many for this purpose, but experience has shown that such applications do little in preventing a regrowth, and there is danger of the cauterization being followed by adhesion between the vocal cords, which would be a serious complication. In my judgment, therefore, since cauterizations do not prevent a recurrence, in cases where the growths extend over a large surface the wisest course to pursue is to remove the obstruction as completely as possible so that free respiration may be established, and wait for the time when the growths shall cease to recur, removing them, meantime, if they should reach a size sufficient to impede the breathing.



In closing, let me remind you that the disease we have been discussing is an extremely rare one. Do not hastily conclude that the first children coming under your care who happen to be hoarse are the subjects of papilloma of the larynx. Many of you will pass the whole of your professional lives without meeting with a single case. But in view of the fatal nature of the affection if not recognized, your attention should be called to it; and I trust that what has been said will enable you to detect it.

## FIBRO-SARCOMA OF NASO-PHARYNX.

CLINICAL LECTURE DELIVERED AT RUSH MEDICAL COLLEGE, CHICAGO.

BY E. FLETCHER INGALS, A.M., M.D.,

Professor of Laryngology and Practice of Medicine, Rush Medical College; Professor of Diseases of the Throat and Chest, Woman's Medical College, Chicago.

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GENTLEMEN,—This man was sent to me from Muskegon, Michigan. He is thirty-nine years of age, a working man, has a family of six healthy children, and tells me that until a year ago he was perfectly well. Ten months ago he began to have very severe pain in the head, occurring either in the occipital or lateral regions, sometimes upon one side, sometimes on the other. This occurred daily until about a month ago, but he has had no pain since then. For a number of years he had some catarrhal trouble, which caused stopping up of the nose whenever he caught a slight cold. About six months ago, his local physician made efforts to remove the nasal obstruction, since which time he claims to have had trouble with the eyes. He says that shortly after the operation he could scarcely see anything, and became dizzy upon turning his head. He hears my watch with the right ear on contact only, but with the left he hears it about an inch away. He began to be deaf about a year ago, at the same time that obstruction of the nose became troublesome. He has not been subject to illness, has had no fever, his skin feels natural, pulse is 96, and he appears to be robust; says he now weighs one hundred and sixty-eight pounds, but that six months ago he weighed two hundred and twenty-five. He now complains of pain in the neck, which did not occur until after the operation; before that, pain was always in the head, however, and was not referred to his throat. There is no cough. He has difficulty in breathing through the nose, but says that there is no dyspnœa when the mouth is open, excepting on exertion; yet when I stepped into the ward to see him, last evening, I was at once attracted to his bed by the loud, semi-stertorous breathing. He now apparently breathes with perfect ease. His articulation is very indistinct, owing partly to obstruction in the naso-pharynx. He has had some trouble in swallowing, which I first



thought due to obstruction in the œsophagus, but he tells me that he is obliged to use his finger and fork to get the food back into his throat. This is in consequence of paralysis of the tongue. You will notice the great difficulty he has in expectoration, from the same cause. There is no change of sensation in the skin; no loss of movement of the trunk, arms, legs, or muscles of the face. He cannot protrude his tongue beyond the lower lip; and he cannot turn it up at the tip. The anterior third of the tongue is wrinkled and contracted, as a result of atrophy. Farther back there appears to be unusual thickening of the left side of the organ, and a little contraction of the right side. His sense of taste remains perfect. I find nothing whatever obstructing the nares; but upon inspecting the throat I can see at once the cause of his difficulty in breathing. I find the tonsils and palate normal, but back of the palate a hemispherical tumor, which is about one inch and a half in width and an inch in thickness, springing by a broad base from the pharyngeal wall. On its surface there appears to be a small ulceration, which I presume is the place from which his physician has removed a piece; excepting this small spot the tumor is completely covered with mucous membrane. I find that it is dense, firm, and almost as hard and unyielding as cartilage, but yesterday I passed a needle into it, and demonstrated that it is not a cartilaginous growth. An unusual prominence in this locality is at once suggestive of an abscess, but we have nothing of the kind in this instance. The question of diagnosis is of peculiar interest in this case. There seemed to me a possibility that this might be a syphilitic outgrowth, for tertiary manifestations are common in this locality, but he utterly disclaims having had the disease, and he has a family of six healthy children and has never had eruptions on the skin or loss of hair; therefore the chances are that it is not specific. The diagnosis is thus narrowed down to that between a fibrous, cartilaginous, or sarcomatous growth. Cartilaginous growths are so extremely rare in this locality that we might almost exclude them without any consideration; however, by passing the needle into this we demonstrated that it was too soft for this kind of neoplasm.

The question of a sarcomatous growth cannot be so easily settled. Ordinarily, such tumors are attended with pain, they are usually comparatively soft and elastic, and they bleed easily; but these symptoms are not always present. There is no pain in this growth, and it does not bleed; it is hard and not elastic. We therefore exclude sarcoma, and are inclined to believe that this is a fibroma; but bleeding is one of the most prominent symptoms of naso-pharyngeal fibromas,

and it has never occurred in this case, though most of the other distinctive features are present. Fibrous growths usually occur between the ages of fifteen and twenty-five, occasionally in younger people, but almost never in older; therefore this man's age would be suggestive of malignant growth instead of fibrous tumor. There is no way by which we can positively distinguish between fibrous growths and sarcoma, except by careful microscopic examination; therefore, for the present, this question must be left partially in doubt.

He has lost quite a good deal in weight, but we shall presently find another cause for this. He says that he passes from sixteen to eighteen pints of urine every day, which is six or seven times as much as natural. The urine is clear, with a specific gravity of 1003, and contains neither sugar nor albumin. He has been passing this excessive quantity for a little over a month. We find, therefore, that in addition to the fibrous growth and paralysis of the tongue this patient has diabetes insipidus. The paralysis of the tongue we are obliged to account for on the theory of disturbance of the hypoglossal nerve in its course or at its origin, and, as diabetes is supposed to result from lesions in the floor of the fourth ventricle or medulla, it seems to me more than probable that there is disease at the origin of the hypoglossal, and that this is the cause of both the paralysis and the diabetes. This appears the more probable, for I can see no possible way in which this tumor could press on the hypoglossal nerve. Usually fibrous tumors in this locality grow from the basilar process of the occipital bone, but occasionally they spring from the side of the pharynx, or, as in this case, the anterior portion of the bodies of the upper vertebræ.

This patient has been treated more or less during the last six months without very satisfactory results. Indeed, the symptoms from which he now suffers have largely come since the treatment began, though not as a result of the treatment. We wish to remove this growth, but it will be a difficult undertaking, fraught with no little danger. Numerous operations have been suggested for removal of fibrous growths in the nasal pharynx. Until a few years ago it was the custom with general surgeons to remove them through openings made in the mouth or nasal passages by extirpation of the superior maxilla. The most popular operation was through the nares, exposed by cutting the nose loose and drawing it up or down. Some surgeons have removed them through a longitudinal slit in the soft palate, but this is objectionable because of the difficulty in getting the wound in the palate to heal. To avoid this difficulty surgeons have tried a transverse incision across the palate, but the results have not



been satisfactory. In the case before us the tumor grows so low (extending a little below the edge of the palate) that the cutting operation from the face need not be considered, for it can be removed in some way through the mouth. Unfortunately, these growths are freely supplied with blood-vessels, and contain but little contractile tissue, therefore if the blood-vessels are cut copious and long-continued bleeding is apt to result. The blood-vessels at the surface of these tumors are large and brittle and bleed very easily, but those deeper seated are generally smaller. Another unfortunate circumstance with these tumors is that they are not always entirely fibrous, but sometimes contain much erectile tissue. Therefore, if injured, the bleeding may be rapid and dangerous. One author has recommended cutting out these tumors, and he appears to have cut and slashed with impunity, but several cases are recorded where death by hemorrhage has resulted from such an attempt.

Dr. Lincoln, of New York, advocates removal of these growths with the galvano-cautery *écraseur*. I have used the method with very satisfactory results in eight cases, and have here two of the specimens which I removed from the naso-pharynx. Both were more or less pedunculated, and upon both you may see the lines where they were cut through with the galvanic cautery. But this tumor is sessile, and has no place where a wire can catch. It has seemed to me that in this case it will be best to try to save a portion of the mucous covering of the tumor by slitting it near the centre and turning it back to the sides, then with a strong gouge try to work the growth off from the base.

These growths have a strong tendency to recur, and to keep returning until the patient has reached the age of twenty-five, at which time there seems to be a tendency to gradual recession. This man is too old to expect anything from this tendency; but in a young person the growth may be removed repeatedly, or it may be kept in check by electrolysis with a strong probability of ultimate cure. Electrolysis has been recommended for the destruction of these tumors, but to accomplish much there have to be many sittings,—usually from fifty to a hundred or more,—and this man cannot remain here so long. I shall first consult with Professor Parkes to determine what will be the safest course, and then you may hear more of this case. In the mean time I shall recommend injecting this growth with a strong solution of iodine. I have seen one case of diabetes mellitus cured by the internal administration of iodine, therefore it would seem as though the remedy might be specially useful not only for reduction of the tumor but also for the diabetes.

## CLINICAL LECTURE DELIVERED ONE WEEK LATER.

GENTLEMEN,—After consulting with Professor Parkes about the patient I showed you last week, we determined that the best thing for the man was to do a preliminary tracheotomy, then split the mucous membrane over the tumor and gouge it out. I learn from the physician who has treated him that the throat was clear until about three months ago. If this be correct, the tumor, which is now about one and a half inches in breadth and fully an inch in thickness,—half the size of a hen's egg,—must have grown within two or three months, and cannot, according to my experience, be a simple fibroid. The man tells me that he is feeling "first-rate," but he passes from twelve to sixteen quarts of urine daily. If he lived here, I should recommend the trial for a time of injections of iodine into this growth, or of electrolysis; but he wishes to go home as soon as possible; therefore more radical measures must be adopted.

In operating on tumors in this region, flow of blood into the trachea can be prevented by placing the patient on his face, at least for short operations, but when the extent of the operation cannot be determined beforehand a preliminary tracheotomy is necessary; and this we shall perform to-day. We can seldom find in the instrument-stores tracheotomy-tubes long enough for adults. Here is one two and one-fourth inches in length on the convex side, which is the longest I was able to find in the city to-day. However, I have an old one about half an inch longer, which we shall have to use in this case, though it is too short. Here is still another tube, made of gutta-percha, which is three inches long but not sufficiently large: hence it will not be used except as a *dernier ressort*.

I mentioned to you at the last clinic the possibility of this tumor being syphilitic. I have since received a letter from his physician, who says the man has been accustomed to drink a good deal in former years, though not of late. Persons who drink are very liable to be exposed to the contagium of syphilis, and therefore we might be suspicious here. The location of this tumor, where syphilitic gummata or abscesses are not infrequently met with, and its rapid growth, are also suggestive of specific origin; but the doctor states that when he gave antisyphilitic remedies the patient became worse. The size and density of the tumor, together with its history and the failure of antisyphilitic treatment, indicate rather that it is of malignant or semi-malignant character.

The patient is now anæsthetized, and, as he is breathing easily, I am



not compelled to hurry. Pinching up a transverse fold of skin, I transfix it with a bistoury and cut it through, thus completing at one stroke the incision down to the subcutaneous cellular and adipose tissue. This I nick with the back of the point of a scalpel, and tear with a director and the handle of the knife until I come down upon the firm fascia covering the muscles. I pinch this up in the middle of the wound with a rat-tooth artery-forceps, and twist out a little piece, making an opening into which the director can be passed, and on this I cut the fascia upward and downward, nearly the whole length of the external incision. I now find a large vein right in the field of operation, but shall be able to go to one side of it. I now tear through the tissues over the trachea with the director, the handle of my scalpel, and my finger, and am rapidly approaching the windpipe. One of the common annoyances at this stage is that the patient is very apt to stop breathing. I can now feel the trachea. With the back of the scalpel I scratch through the remaining fascia, and, catching the upper end of the trachea with a tenaculum, draw it upward and forward, then, entering the scalpel at the lower angle of the wound, cut upward, divide three of the cartilaginous rings, and turn the blade in the wound to admit air. You notice that the patient is coughing. This we always expect as soon as the trachea has been opened. I now put a strong thread through each of the cut edges of the trachea, tie the two ends of each together, forming loops six inches in length, and thus secure absolute control of the situation for the next four or five days; by that time these will ulcerate out; but they will not be needed longer. These strings make it easy to open the wound to introduce the tracheal canula, or replace it if it should be coughed out. Upon inserting the canula, which is two and three-fourths inches in length, it at first seems longer than necessary; but there will be considerable swelling, and we shall find it none too long. The canula is fastened in position by tapes tied about the neck. I usually place one or two stitches either above or below the tracheotomy-tube, but it is not a matter of much importance, for they usually give out. We now draw a strip of gauze under the edge of the collar which holds the canula, to prevent it from gouging into the neck, and the operation is complete. The dressing consists of a piece of gauze folded upon itself and held in position by a strip of bandage tied about the neck above the wound. This lies down over the tube, and keeps the patient from coughing out mucus and blood upon the bedding. This patient will now be kept in a room at a temperature of 80° for a number of days. It is necessary to keep the temperature high; otherwise cold air, coming directly in contact with

the bronchial mucous membrane, is almost sure to set up inflammation. In this case the nurses will be directed to remove and clean the tube once or twice a day. If it were a case of diphtheritic croup, I should have the inner canula removed every one or two hours at first, because there is a tendency to increased formation of mucus, which soon clogs the tube, and, becoming dry, will obstruct respiration as completely as false membrane in the glottis. To clean the canula it should be washed with a solution of carbolic acid and soda, and a swab should be passed through to cleanse the inside. The object of the inner canula is now apparent, for if we had but a single tube it would be impossible to clean it without removal from the wound; when the inner tube is taken out, all of the adherent secretion comes with it. Usually the neck is quite sore for a couple of days, so that touching the tube gives pain; but this can be largely prevented by steadying its collar with the fingers whenever anything is done with it. This patient will probably require no treatment for the tracheotomy except to be kept in a warm room, but there may be necessity of making the atmosphere moist. The external wound will mostly heal within eight or ten days, and we may then do the operation in the pharynx.

The operation has lasted about fifteen minutes.

[*Later Note.*—The patient made a good recovery from the tracheotomy, and in about ten days was again anæsthetized and placed on the table in the prone position for operation upon the naso-pharyngeal growth through the mouth. This operation was done by the late Prof. Charles T. Parkes. The mucous membrane over the tumor was first laid open and an attempt was made to crowd it back, but bleeding was profuse and the field of operation so obscured that the operation had to be completed by the sense of touch. The mucous covering was thus sacrificed and the growth hastily removed with the gouge, forceps, scissors, and cutting forceps, by which means all of the growth was removed excepting a part about as large as a large filbert upon one side of the pharynx, which I subsequently removed with the snare. As soon as the mass had been removed the naso-pharynx was packed with iodoform gauze, which checked the hemorrhage. This was gradually removed piece by piece during the next twenty-four hours, and no further bleeding occurred. Healing progressed slowly for about two weeks, when the patient left for his home in Michigan. At the end of about ten months the patient is still alive, but weak and emaciated. The tumor, I am told, has partially returned and been removed again and again, and the diabetes has been largely relieved by opiates.]



**CHRONIC INFLAMMATION OF THE TONSILS  
CAUSED BY THE LEPTOTHRIX BUCCA-  
LIS; EPISTAXIS, ITS CAUSES  
AND TREATMENT.**

CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL  
SCHOOL AND HOSPITAL.

BY CLARENCE C. RICE, M.D.,

Professor of Diseases of the Nose and Throat; Consulting Physician, Bellevue  
Hospital, O. D. P., etc., etc.

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**CHRONIC INFLAMMATION OF THE TONSILS.**

GENTLEMEN,—The first patient to-day is a physician who has kindly consented to come before you. His case is an interesting one from the fact that it demonstrates a rare disease,—chronic inflammation of the tonsils. Do not mistake this condition for that of chronic enlargement of the tonsils. We see many cases of enlargement of the tonsils, mainly among children; and such tonsils are not disposed to inflammatory attacks and their enlargement is not due to inflammation. The condition of chronic inflammation is shown here not only by enlargement but also by the color of the tonsils and the pain, which has been constant for several weeks. Such tonsils are apt to bleed freely if excised with the tonsillotome. The galvano-cautery is therefore to be preferred for operation in such cases.

This condition of chronic inflammation is here occasioned by the presence of the micro-organism called the leptothrix buccalis. Masses of this vegetable parasite may be found as white points at the mouths of the lacunæ of the tonsil. They may be taken out from the tonsillar crypts with a probe. Often they are discharged spontaneously. You are all familiar with the foul smell and the cheesy composition of these little masses. They are one of the causes of foul breath, other causes being atrophic rhinitis, carious teeth, and gastric disorders. The leptothrix plugs are found also in the lymphatic tissue at the base of the tongue and in the adenoid tissue at the vault of the pharynx. This

plug, acting as a small foreign body, produces congestion and sometimes a chronic inflammatory process. Microscopically these masses consist of the leptothrix, masses of fat, and broken-down epithelial elements. Chronic abscess of the tonsil is caused by these same leptothrix elements. The mass is confined within a closed crypt, produces a low grade of inflammation and, eventually, suppuration. The tonsil of one side is inflamed and painful for weeks or months, and if we cut into the tonsil we find a bag of pus. Such abscesses are, however, very rare.

I saw recently a very remarkable case of leptothrix accumulations at the base of the tongue. The lady was a private patient. She complained of the frequent presence of these foul-smelling masses in the mouth, and was much annoyed by the fear of having a foul breath. She had small tonsils, which were carefully examined without finding the leptothrix. The laryngeal mirror, however, showed that the base of the tongue was studded by small white points; there were hundreds of them; the back of the tongue was as white as milk, caused by the largest collection of leptothrix elements I had ever seen. With the galvano-cautery each tonsillar crypt was destroyed. She was treated three times, the second time about a month after the first treatment, when it was found that about three-fourths of the trouble had been removed, and with the three applications all of the cheesy accumulations were destroyed.

The leptothrix buccalis is found in carious teeth and in the accumulation known as tartar, and microscopical examination of the secretions of the mouth will almost always find them. They rarely cause tonsillar inflammation, because the lacunæ are open, and these germs are rapidly removed by drinking and eating. From my own record of cases, I should say that these cheesy masses do harm most frequently where the tonsils are small and the crypts more or less covered by the pillars of the pharynx.

You will look, then, for these collections in the lymphatic tissue of the base of the tongue, in the faucial tonsils, and in the adenoid tissue of the vault of the pharynx. The latter is not commonly named as a location for the leptothrix buccalis. I have seen four cases. In two the presence of the parasite was demonstrated; in the other two the inference was clear. The foul mass was hawked down from behind the soft palate.

The treatment of this condition consists in the destruction of the little pocket in which the caseous mass is confined. We may use for this purpose the saturated solution of chromic acid upon a cotton-



wound probe, closing the duct by adhesive inflammation. A quicker remedy, however, and one more satisfactory and sure, is obtained by the use of the galvano-cautery.

I have here one of these cheesy masses which can be examined microscopically if one of the gentlemen will get a slide. In this case of chronic inflammation of the tonsils both of these glands are congested, the lacunæ are small, and the leptothrix masses are not in sight, but are deeply buried. The patient tells us that he has been troubled with a sore throat for seven or eight years, and that he has himself picked out these cheesy masses. The condition is one of long standing.

In applying the cautery here I shall use a large flat electrode. Two varieties of electrodes may be used in this operation. One has a flat surface which is allowed to burn the surface of the tonsil; the other is a thinner, pointed instrument, which is carried into the crypts of the tonsil. It is not necessary to destroy the whole of the tonsil. Burning to the depth of one-fourth inch will destroy the lacunæ of the gland and prevent the accumulation of the leptothrix. In the course of your operation be careful not to seorch the pillars of the pharynx, and especially avoid touching the uvula. The patient will suffer much more from such an accident than from the burn upon the tonsil itself. We shall expect that this throat will be but very slightly sore from the application of the cautery, because the pillars of the pharynx are not adherent to the tonsil and the inflammation caused by the burning will not be apt to extend to them. It is inflammation of the pillars of the pharynx which causes a sore throat, and not inflammation of the tonsil itself. In the second place we have removed the cause of the chronic inflammatory condition, and hence this inflammation will subside and we shall expect that the degree of relief will be greater than the inflammation which will result from the use of the cautery. The following gargle will be prescribed:

℞ Acid. carbolic., ℥ss;  
Menthol, ℥ss;  
Tr. myrrhæ,  
Spts. lavend. co., āā ℥ss;  
Listerine, ℥j.—M.

Sig.—A teaspoonful in one fourth glass of water used as a gargle every two hours.

## EPISTAXIS.

The second patient complains of severe and frequent nose-bleeds, which commenced three months ago. He says he has had nose-bleed every morning for two weeks. He thinks that he has lost as much

as a pint of blood at one time, and he says that the bleeding has been controlled only by plugging the nostrils with cotton. Epistaxis is an interesting clinical condition. It is a symptom in chlorosis, pernicious anæmia, and in the later stages of typhoid fever, pneumonia, and pulmonary phthisis. Occurring in a comparatively healthy person it is commonly ascribed to the hemorrhagic diathesis. Such people are called *bleeders*. I have not so strong a belief in the hemorrhagic diathesis as I had five years ago, as it is almost always possible in cases of epistaxis to find a local cause for the hemorrhage. Usually the bleeding comes from one or more small ulcerations situated well forward upon the cartilage of the septum. In the future I doubt whether we shall find it necessary to plug the posterior nares for the relief of nasal hemorrhage, as we can nearly always locate the bleeding point and control the bleeding with astringents or with the galvano-cautery. In my experience most cases of epistaxis occur in boys from sixteen to twenty years of age. I do not know, however, that boys are really more apt to be attacked than girls, nor do I know any reason why this age should be most often selected. These nasal ulcerations are frequently associated with an atrophic rhinitis. They are often found upon the convex surface of the cartilage in deviation of the septum, and upon cartilaginous and bony hypertrophies,—prominent parts are especially apt to receive injury and to be irritated by the efforts to keep them clean. Where the bleeding point is difficult to locate it is my practice to rub the whole surface over with a cotton-wound probe, so as to produce a general bleeding. I then apply to the whole a sixty-grain solution of the nitrate of silver. This will whiten the whole surface except the two or three ulcerated and bleeding points which show very plainly upon the white background. These may then be treated with the galvano-cautery, a solution of chromic acid, or a sixty-grain solution of silver.

We have also hemorrhage after operation, which may be called traumatic hemorrhage, and which may be so far back as to require plugging to control it. In checking hemorrhage I first use a ten-per-cent. solution of cocaine, preferring it as an astringent to alum, tannic acid, or Monsell's solution. With a slender pair of forceps a pledget of cotton can be carried well back in the nostril, and this can be followed with others until the nostril is filled. In plugging I use absorbent cotton wet with a solution of the bichloride of mercury, one to one thousand. This should usually be removed at the end of thirty-six hours, and should never be left longer than forty-eight hours, as by that time the antiseptic solution has been washed out, the secretions



of the nose have commenced to decompose, and we may have signs of septic absorption, such as a rise in temperature, quickened pulse, neuralgic pains in the face, eyes, and nose, and general malaise. Thin layers of cotton will control hemorrhage, and it is unnecessary to force in thick plugs, which give the patient great annoyance.

In hemorrhage after operation hot water is sometimes used to control the bleeding. A pitcher of almost boiling water is on a stand by the operator, and three or four cotton-wound applicators are in readiness. I have seen very severe hemorrhage quickly controlled by the passage of these cotton-carriers into the nose. Cold water carried through the nose is also sometimes used for this purpose. Posterior plugging with nasty solutions of iron is out of date.

In this case you see how small the point is from which the hemorrhage has occurred, and situated, as usual, upon the septal cartilage. I was recently called to the Infant Asylum up in Westchester to see a case of nasal hemorrhage in a woman thirty-five years of age. She had had violent bleeding several times before, and this time so severe as to threaten her life. After trying all kinds of astringents in this case the attending physician had plugged her nose. I removed the plug and the hemorrhage recommenced. With the aid of the nitrate-of-silver solution, however, two or three small bleeding points were seen, and upon applying to them the sixty-grain solution of silver all bleeding ceased. The amount of blood which can be lost from one of these small points seems incredible.

In closing, let me ask you to have a strong illuminating apparatus, search for the bleeding point, which will be discovered nine times out of ten upon the cartilaginous septum, and then treat it as you would treat any ulceration of the mucous membrane. Do not plug the nostrils if it can be avoided.

# Dermatology.

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## ERYTHEMA EXFOLIATIVUM RECURRENS.

CLINICAL ARTICLE WRITTEN FOR INTERNATIONAL CLINICS.

BY HENRY WILLIAM BLANC, B.S., M.D.,

Dermatologist to the Charity Hospital, New Orleans; Lecturer on Diseases of the Skin, Medical Department Tulane University of Louisiana; Instructor in Skin Diseases and Syphilis, New Orleans Polyclinic, etc.

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EVANESCENT hyperæmiæ of the skin are so commonly met with that they usually attract attention only when accompanied by some peculiar symptom or phenomenon which shows them to be a little out of the ordinary run. The erythema of the overfed infant, the eruption produced by the ingestion of certain drugs, such as quinine or copaiba, the redness that occasionally appears in certain stages of diphtheria, varicella, and typhoid fever,—to say nothing of a large number of erythemas due to unknown causes,—have usually been summed up by the general practitioner in the one term “rash,” and dispelled from the mind as clinical curiosities which have no special significance.

But of late years these eruptions are being more carefully studied than heretofore, in some cases interesting facts bearing upon their etiology and pathology have been ascertained, and, as the literature upon the relapsing exfoliative variety is somewhat scanty, the clinical record of two cases observed by me is herewith presented.

J. C., aged twenty-three years, white, male, consulted me September 9, 1890. Occupation, cotton screwman. A native and resident of New Orleans. Both parents living and in good health, though father is addicted to drink. Father forty-nine years of age; mother forty-four years of age. Has three brothers and two sisters, all of whom are healthy. No one in the family has had scarlet fever, diphtheria, yellow fever, small-pox, or rheumatism, though patient had measles when six years old. He has a twin brother, but the latter has never had any similar affection.

In the year 1877, when ten years of age, he was treated by a physician for what seemed to be scarlet fever. The disease lasted several



weeks, leaving him perfectly well after desquamation. He was troubled no more until the following spring, when all the symptoms of scarlatina reappeared, and his physician told him that he was suffering from this malady a second time. From this time until 1884 he was subjected to two attacks annually, in the spring and fall, but during the whole of this year (1884) he escaped. The intensity of the fever and eruptive symptoms seems, according to his account, to have gradually grown milder on succeeding attacks, as he has seldom been confined to his bed of late. On the other hand, the stage of desquamation has become more marked, until the epithelial masses falling from his skin are of sufficient size and integrity to retain the shape of the part from which they are peeled. Latterly the attacks have been somewhat irregular, though usually appearing twice a year, and on a number of occasions have destroyed all of his finger-nails, causing them to fall out, disclosing a small, new nail beneath.

The history of a single attack, as given by the patient, who has observed his case closely, is as follows: After a feeling of malaise for a day or two, a high fever appears, lasting forty-eight hours. (The fever, I suspect, is not so great as he supposes, though it is accompanied by headache and itching.) Occasionally there is slight sore throat, but this has never given trouble. There are no catarrhal symptoms,—he has no sensation as if he had a “cold.” The rash appears usually on the second or third day, and lasts about four days. During this time there are paroxysms of itching, usually six or seven in twenty-four hours, being more aggravated at night. The skin during the latter period of the eruption has a hard dry feel to the patient, as if he were covered with thick paint. It then begins to dry and “blister,” the sensation at this time being as if an insect were crawling about under the skin. The duration of an attack is about five weeks from the initial headache to the completion of desquamation, though, when it is severe enough to remove the nails, this period is one month longer.

When first seen by me the patient was in the second day of his eruption, the attack being milder than usual. His temperature was half a degree above normal. The soft palate showed a slight erythematous blush, and the tongue, though slightly coated brown, had a perfectly normal edge and tip. A mild erythematous eruption covered his entire body, being most marked on the arms, shoulders, and thighs. The redness disappeared upon pressure. Elsewhere there was nothing more than that hypersensitive condition commonly accompanying erythematous diseases, and which in this case seemed to have been aggravated by scratching. No other symptoms were noted at

this time, and when seen six days later desquamation was the prominent symptom. The hyperæmia had entirely disappeared, and scales half an inch in length were noted here and there. He complained of a cold sensation and very tender surface, declaring that when the skin first began to crack he had had a chilly feeling lasting four or five hours.

To convince me of the intensity of his last eruption he brought me what he described as his "gloves" and "slippers." The former were some remarkably complete natural gloves (see frontispiece), one from either hand, and being stuffed with cotton, they looked exceeding natural, with the exception of their slightly yellowish color. So perfect were these fingers that they had scarcely been broken, save at the nails, when the living hand was slipped out of its dead shell. Two warts, one on the back of the right hand and one on the third finger, were as natural on the glove as on the hand held next to it for comparison.

The specimens from the feet were only complete as regards the soles, the friction of the shoes and constant motion in walking preventing these from being as perfect as the exfoliated hands. I was informed by the patient that it was his habit to keep the skin of the hands intact by wearing kid gloves during desquamation.

No further attacks followed until May 17, 1891, when I was called to see him in consultation with Dr. C. L. Seeman, who is his family physician. It was a Sunday morning, and the patient had been perfectly well up to the previous Thursday, when he went to work in the hold of a ship unloading grain. On returning home that evening he was very tired, as he had not worked hard for some weeks, but knew from his sensations that he was going to have the eruption again. Questioned as to the character of his occupation, he stated that just preceding the last three attacks he had begun to *work in grain*, though he was inclined to attribute them to the unusual exertion exacted by his work. Other attacks on former occasions could not be ascribed to this cause.

Dr. Seeman had found his temperature the day before to be 102° F. When taken by me it was 100.2°, the pulse being 85. The eruption, which had begun on the thorax the previous day, consisted of a diffuse, flat erythema of a deep-red color, being most marked on the trunk, arms, hands, and thighs. The face was flushed, but not very red, and the feet were almost normal in appearance. There was no swelling or œdema anywhere. Fauces red and tongue slightly coated, being red at the tip with enlarged papillæ. No coryza. Has suffered and is still suffering considerably from pains in back, hips, and knees. Summed up briefly, the history of this attack is as follows :



Thursday.—Handles grain in the hold of a ship, and feels very tired at night.

Friday.—Malaise, pain in back and limbs. Fever in the evening. Constipation.

Saturday.—Temperature  $102^{\circ}$  F. Bowels moved by a cathartic. Eruption over the sternum begins in the afternoon. Has a sensation of sore throat.

Sunday.—Eruption spreading all over the body. Fever declining in the morning, and registering  $100.2^{\circ}$  at 5 P.M. Pulse 85. Rather nervous, and has paroxysms of itching. Bromide of potassium and chloral.

Monday.—Fever gone, eruption disappearing rapidly, and skin feels hard.

The following Monday, May 25, the patient was peeling in large flakes, in some places the dry skin being raised, like a blister, but containing no water beneath. The urine was examined by me during the eruptive stage,—May 18,—and found to be normal in color; specific gravity 1017; acid. It contained no albumin, casts, or sugar. On May 25 it was again examined, with the same results, the specific gravity being 1016. On June 1 patient was still desquamating, but it was evident that the stage of desquamation would soon be completed. The new skin was still very tender, but there was no loss of finger-nails. He declared that the only way in which he had profited by the disease was in its beneficial effects on his complexion, as all of his freckles passed off after every desquamation.

A case similar to the foregoing, and of which I have made the same diagnosis, presented itself to me at my office on the 17th of last February,—Mrs. S., aged twenty-one years, a resident of Natchez, Miss. Her story was as follows:

In 1883, at the age of thirteen, she was very ill in Natchez with an attack of scarlet fever, the disease lasting about eight weeks. She made a good recovery from this, and was well until 1885, when she was again (while in Cincinnati) stricken with scarlet fever, the disease lasting about six weeks. There was nothing especially noticeable about this last attack, except that the desquamation was excessive. The diagnosis in each case was made by a regular practitioner. Patient remained free from the trouble until October, 1889, when a scarlet rash, similar to the ones she had previously suffered from, appeared, this time without fever. It lasted two or three days and disappeared, to be followed by profuse desquamation which lasted from five to eight weeks, the epidermis peeling in large flakes. She states that the desqua-

mation did not begin immediately after the subsidence of the rash. During the intervals between these attacks her health was very good, menstruation being regular and painless.

In March, 1890, she was married, and during the next month another athermal rash appeared. This covered the surface, but was not very deep except on the hands and feet. As usual, a large amount of desquamation followed the eruption. In December a baby was born, and in January and February she was twice afflicted with the rash, always followed by peeling. During this time she nursed her baby regularly, but did not communicate the disease.

While still peeling from the February attack she consulted me. She was accompanied by her baby, a child apparently in perfect health, which was nourished solely with breast-milk, of which the mother had an abundance.

Patient was of medium height, rather stout, with light-brown hair, and a complexion neither light nor dark. Skin had a slightly transparent appearance, suggesting anæmia. On the neck, forearms, and legs the skin was dry and scaly, peeling easily when rubbed. Tongue normal in appearance,—perhaps a little pale,—though patient stated that some six days previously it had a red edge and that the throat was painful. On the day of examination the throat was normal. There was some hyperæsthesia, which she said was always present during the scaling period, and followed a condition of diminished sensation, the immediate result of the rash. The treatment suggested by me was of a tonic nature, cod-liver oil three times a day, and occasional artificial feeding for the baby to relieve the constant drain upon the mother. Living away from New Orleans, she promised to let me hear from her as to her future course, and five weeks after our interview addressed to me a letter, of which I append an extract:

“I am sorry to have to chronicle to you the return of the erythema, and with exactly the same symptoms. On Wednesday I contracted, as I thought, a severe cold, and my throat ached all night. Thursday I sneezed all day, going to bed with the cold, to awake the next morning with a burning sensation in the fingers, palms of the hands, toes, back, throat, tongue, and eyes. I got out of bed to see, and found all of the above-mentioned parts *fiery* red. To-day (Sunday) the rash is still out, but is disappearing on my back, and it now begins to itch. My bowels were a little constipated.”

There can hardly be any reason to doubt the similarity of these two cases. Both had at the beginning a severe attack of scarlatina or, at any rate, a fever which could not be differentiated from it. For a



while the attack of the man seemed to reappear with a certain regular periodicity, becoming irregular later on. Not so with the woman; hers have gotten more frequent of late, owing perhaps to slight debility and the constant drain upon her system from a young and feeding infant. Each gives a history of fever at the beginning, diminishing with later attacks; each has the dry skin becoming tender on peeling; and each an extraordinary amount of desquamation.

The man's hands and feet showed the greatest amount of exfoliation; the woman's hands and feet showed the greatest amount of burning and redness. The difference in sex and occupation will account for these results, for the man belonged to the working-classes while the woman was a lady of refinement.

Beyond the first febrile attack no predisposing cause could be noted in either case, though it is probable, in the case of the young man, that unusual exertion or some external irritant may have operated in producing the relapses. Neither case gave any family history of similar or kindred diseases, and there was nothing to show that the skins of these two persons would, under other circumstances, have presented any peculiar appearance.

The name which has been chosen as the title of this paper, though not to be considered as final, seems to me to express the chief characteristics of the disease here described. It is to be regarded as simply a revision of names already existing, and an attempt at somewhat abbreviating the ponderous titles suggested by French writers. Of the three words in Relapsing Exfoliative Erythema, the last is the one most likely to elicit general discussion, for the two former express peculiarities constant and striking. We will therefore give briefly our reasons for adopting it. In the foregoing cases the appearance of the eruption was from beginning to end that of a general erythema, there being no papules or other lesions noted at any time. The term "scarlatiniforme" has been applied by some authors to this affection in conjunction with erythema, and it certainly expresses the character of disease which it most closely resembles; but on studying over my own as well as a number of other reported cases, I am convinced that this disease loses to a great extent its striking resemblance to scarlatina on ameliorating with the lapse of time. Besides this, the scarlatinal lesion is itself but one of the exudative hyperæmiæ which is commonly recognized by the eye as an erythema. Leloir and Vidal replace the term "erythema" with "dermatitis," inasmuch as "the skin is inflamed and not simply hyperæmic," but as long as pathologists are willing to speak of pernio, sunburn, and the erythrodermatous manifestations of cholera,

typhus fever, and gonorrhœa, as forms of erythema, the disease under discussion will be fairly entitled to the name which has been applied to it by the clinician.

Interesting cases have been reported by a number of observers, conspicuous among whom are Féréol<sup>1</sup> and Besnier, who describe it under the title of "Erythème desquamatif scarlatiniforme récidivant." The latter,<sup>2</sup> in an article on the "Pathogénie des Erythèmes," has made a valuable contribution to the study of the disease. This is doubtless the same affection studied by Brocq<sup>3</sup> in his "Étude critique et clinique sur le Pityriasis rubra."

The disease is evidently not a new one, and when its chief characters become more generally known a larger number of cases will doubtless be placed on record.

Leloir and Vidal<sup>4</sup> refer to a paper published by Benjamin Gooch, in "Philosophical Transactions," as far back as 1769, entitled "Account of a Singular Separation of the Cuticle." Other writers named by them, who have described relapsing exfoliative erythema under a variety of titles, are John Latham, "Philosophical Transactions," 1770; Thomas Newell, London *Medical Gazette*, 1829.

In a paper read before the American Medical Association in May, 1890, Dr. Ohmann-Dumesnil<sup>5</sup> discusses the scarlatiniform erythema of typhoid fever, citing several cases, and giving the literature upon the subject. Mention is made in this paper of the tendency on the part of this disease to recur, but no detailed account of relapsing cases is given.

A peculiar characteristic of relapsing exfoliative erythema was observed by my friend Dr. Seeman in the first case here reported and in another case seen by him some years ago, and of which he had kept a few notes. This is the slowness of the pulse and the absence of the usual relations noted between pulse and temperature in scarlatina. Dr. Seeman's first case was a white girl, aged thirteen. She had had three similar attacks previously. He was called in on the third day, the eruption having been out twelve hours. Her temperature was 103° F. and her pulse 100. This same ratio lasted throughout this and other similar attacks.

<sup>1</sup> Bulletins et Mémoires de la Société médicale des Hôpitaux de Paris, 2e série, t. xiii., année 1876, p. 30 et suiv.

<sup>2</sup> Annales de Dermatologie et de Syphiligraphie, Janv., 1891, p. 1 et suiv.

<sup>3</sup> Archives Générales de Médecine, 1884, vol. i. p. 350.

<sup>4</sup> Traité descriptif des Maladies de la Peau, 1891, 3e livraison, p. 163.

<sup>5</sup> Journal of the American Medical Association, August 2, 1890, p. 164.



As is well known, the pulse in scarlatina is usually rapid and out of proportion to the intensity of the eruption, and Dr. Wertheimer, in the *Münchener Medicinische Wochenschrift*, reporting a case of scarlatina without pyrexia, occurring in a child seven years old, cites this fact to confirm his diagnosis. He found all the symptoms of this disease to be present, but the highest temperature reached was 99.6° F., while the pulse ranged between 116 and 120 during the first three days.

Other similar apyrexial cases are referred to in his report, the pulse showing marked rapidity.

But one of the most notable descriptions that I have seen of the disease considered in this paper is that recently published by Dr. J. Frank, of Chicago.<sup>1</sup>

His case was a man thirty-three years of age, a native of Montana, and a miner by occupation. Owing to troublous times, the patient's mother gave birth to him in the open woods, but he remained perfectly well until the age of seven months, when he was attacked by a vomiting spell, accompanied by fever and a scarlet eruption, followed by desquamation of the cuticle and the loss of his nails. This was repeated every year at exactly the same date, thereby enabling the patient to predict the day and hour of recurrence. The highest temperature noted in this case was 103° F., the pulse being 88.

The etiology of relapsing exfoliative erythema is as yet quite obscure. The blood has never been analyzed, as far as I am aware.

Some remarks of Dr. Frank upon the question of the etiology appear to me quite pertinent: "If we look into certain types of hay-fever, we will find cases described in which the patients attacked have an attack on the same day and even the same hour each year, and possibly, as in this case, it can be accounted for by the fact that it is a disease of the nervous system."

The recent researches of Léon Perrin on the *cutaneous manifestations of gonorrhœa* would seem to throw some light upon the subject of reflex dermatoses. Perrin reports a number of cases of gonorrhœa, in the course of which a scarlatiniform eruption has appeared, and after excluding such possible causes as copaiba, cubebs, and the like, he arrives at the reasonable conclusion that the urethral disease was itself the exciting cause of the eruption.<sup>2</sup>

He agrees with Fournier, Lewin, and Besnier as to its reflex

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<sup>1</sup> A Remarkable Case of Skin-Shedding, *Western Medical Reporter*, February, 1891, p. 37.

<sup>2</sup> *Annales de Dermatologie et de Syphiligraphie*, October and November, 1890.

nature, and classifies blennorrhagic erythema as an angioneurosis produced by the action of gonorrhœa on the vaso-motor system. Admitting that the balsamics, and more particularly copaiba, are capable of producing erythrodermatoses, he believes it to be necessary, in order that they may act thus, that the soil should be already prepared by an attack of gonorrhœa.

In other words, blennorrhagic erythema is due, according to this writer, not to a poisoning of the system by absorption of the products of inflammation or the elimination of these products through the skin, but to the reflex action of the vaso-motor system responding to irritation of the genito-urinary apparatus. These views seem to be exceedingly plausible, and in the absence of further data on the subject I am inclined to accept them provisionally.

The extraordinary sensitiveness of the vaso-motor system to exciting causes, even those of a psychical nature, is well known, and there are cases recorded where the ordinary *erythema pudoris*, usually deemed physiological where due to joy, surprise, modesty, etc., has developed into an oft-occurring condition completely beyond the control of the individual, causing it to be considered worthy of special treatment.

It seems, therefore, probable that the erythema of gonorrhœa and the form of erythema which gives title to this paper both originate in a profound impression made upon the vaso-motor system; in the one case the location of the irritant being the genito-urinary apparatus, and in the other case the integument. The reasons for the recurrence of the latter and not of the former are not so apparent; atmospheric conditions may temporarily derange the circulation in a skin already sensitive from scarlet fever or some local irritant;<sup>1</sup> volatile substances breathed into the nostrils or lungs may excite, as in cases of hay fever, or, perhaps, certain kinds of drugs or food taken by the mouth may serve to upset the equilibrium of the vaso-motor centre.

In the case referred to, reported by Dr. Frank, there must have been some psychical influence added to the pathological cause in order to produce an annual relapse at the same day and hour regardless of leap-years and the changes of the seasons.

The pathology of this disease has been studied by Suchard, Gaucher, Petrini, and Babès,<sup>2</sup> but as yet no facts permitting its differentiation

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<sup>1</sup> Besnier reports a case of recurrent erythema in a syphilitic who took the proto-iodide of mercury.

<sup>2</sup> Leloir and Vidal, loc. cit., 3e livr. p. 167.



from kindred affections have been elicited. These observers have noted elongation of the papillæ of the skin and an infiltration of the papillary layer with round cells. The blood-vessels are dilated, and the derma is slightly œdematous.

Suchard and Siredey have examined the cutaneous nerves and found them sound.

Petrini and Babès having found considerable thickening of the granular layer of the epidermis in the interpapillary regions, with a decided increase of the eleidin, the former concludes that it must be admitted that there is an abnormal activity in the epidermis and a more abundant formation of eleidin occurring in this affection during the stage of desquamation.

## VEGETABLE PARASITIC DISEASES OF THE SKIN; FAVUS; TRICHOPHYTOSIS; CHROMOPHYTOSIS.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY OF THE CITY OF NEW YORK.

BY HENRY G. PIFFARD, M.D.,

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GENTLEMEN,—There are parasitic affections of the skin of two entirely different classes,—viz., animal and vegetable. In previous lectures we have considered the affections of the skin of animal origin,—phtheiriasis and scabies. There are, besides these, three of vegetable origin, which are easily recognized both by the naked eye and under the microscope, and which are important from the fact that all three are exceedingly obstinate and difficult to cure. The *achorion Schönleinii* produces favus; the *trichophyton tonsurans* is the cause of trichophytosis; the *microsporon furfur* is the essential cause of chromophytosis. These are the three most frequent and most important of the vegetable parasitic diseases of the skin.

### FAVUS.

Favus is an affection of the skin, most frequently beginning in early life and most commonly met with on the scalp, and characterized by the appearance of a little whitish or cream-colored speck. As the speck enlarges, it gets a slight tinge of yellow. As it still further enlarges, we find that it is somewhat cup-shaped, its outer surface is slightly depressed, and we also notice that through the centre of this crust there will be seen a hair surrounded by a slight sulphur crust, readily detached, and leaving a slight depression of the skin. The crust corresponds to a hair-follicle. If we extract the hair, we shall, perhaps, find a few little ovoid spores attached to it and covering its surface. If you examine the hair-follicle after the hair is taken out, you will find that its walls are very thickly lined with these spores, which are somewhat rounded at one extremity and somewhat blunt at the other. You will find, also, the same thing in the examination of



the crusts. You will find inside the crusts certain mycelial tubes, which may be straight, wavy, or branched. They may be empty, or you may notice in them small, very refractile bodies, which are spores. We call the large ones spores. These fungi, then, consist of spores, or of tubes, which may be empty or may contain spores. The spores may be isolated or joined together. They are capable of cultivation artificially, since you can inoculate them on gelatin or agar or other nutrient substance, and can thus propagate a colony of the achorion. The hair itself does not seem to be diseased, but the follicles are seen to be filled with spores. As these become more numerous the crusts increase in number, become confluent, and lose the characteristic cupped appearance; and you may find them after a few months in a mass, which is dried, and of a sulphur-yellow, not a deep yellow, color, with hairs coming through it at various points.

The disease tends to spread over the entire scalp, and may do so, yet this is not a matter of months but requires years. You will meet with cases of the disease in persons who have had it for five, ten, fifteen, twenty years or longer. You may ask why the disease has been so long in progress; the reason is because it is very difficult to cure. It is an affection characterized by the development, growth, and increase of these parasitic organisms,—the achorion in the hair-follicles and on the surface,—and you can readily understand some of the difficulty which surrounds the treatment. If you shave off the hair, and if you remove the crusts mechanically, or what not, you have only a surface cleaned off. It remains so for three or four weeks, but then you will find it covered again with these little umbilicated crusts. We cannot cure the disease by surface application, but must get down into the follicles. The question is, How is this to be done?

The treatment of this disease received a great deal of attention in France forty or fifty years ago. The fashionable treatment at that time was one devised and carried out by a couple of French quacks called the "Frères Mahon." They employed a cap lined with Burgundy pitch, or some similarly sticky substance, and put the cap on the scalp so that it was covered all over with this pitch. By the next day the pitch had formed a close adhesion to the hair; then the plaster was taken at one end and stripped off quickly and violently. The result was that most of the hair came out with it, and sometimes pieces of the skin as well. This treatment has been followed by death. The pitch-plaster, as I said, pulled out most of the hair, and wherever a follicle was thus left empty there was a chance for the ointment or lotion, or what not, to get into it and destroy the fungi; in other words,

they devised a method of treatment which theoretically was probably the right one, but which practically was altogether too severe and cruel.

Bazin, a French dermatologist, saw the value of the principles which underlie the Mahon treatment, and he carried it out, but with less cruelty and pain, and in a convenient method, by pulling out a few hairs at a time with a pair of nippers. In other words, the treatment of Bazin, which is, I think, the best treatment ever devised, consists in pulling out one by one the hairs from a given area. If the area be extensive, you cannot at one sitting pull out all the hairs, unless the sitting is a very long one. You can, however, have a number of sittings every day until the whole area has been depilated. It does not matter what kind of tweezers you use. I devised some forceps myself, but the best are those gotten up by Bergh, and with these you will remove all the hair from the affected area, and to the denuded portion of the skin you will make an application, which shall sink into the empty follicles and destroy the fungus inside of them. For this the best application is one of the nature of a parasiticide,—by that I mean an application which will kill the fungi. Now, I don't believe that the applications kill all the parasites. What they do kill is those lining the membrane of the follicles. The applications most frequently used are solutions of bichloride of mercury, one-half to one per cent. These applications should be made every day or two, according to the amount of inflammation they cause. It is best to use one-half of one per cent. to begin with, and make the applications frequently,—at least every day or better, perhaps, twice a day,—thus using a weaker solution, but keeping it up for a considerable length of time. Keep it up until the hair begins to show in the follicle and has a healthy appearance. Now, if you pull out a healthy hair from its follicle, you will leave the papilla behind, and from that another hair is generated. In favus, however, you may or may not have a renewal of the hair. If the papilla is injured, the hair will be more or less destroyed, or if the papilla is destroyed by the fungus no hair will be renewed. A case of favus where you see a half-dozen patches, none larger than a twenty-five-cent piece, might at first sight appear to be a disease easily dealt with in the fashion I have mentioned; but practically you have to treat it not for weeks, but for months. You will have to go over the patch, carefully pulling out all the hair, and making the applications as thoroughly as you can, or the patient must do so at home. Still you will find that two or three weeks after the beginning of treatment the little crusts appear on the surface and the disease comes back again; and so it will be,—you can hardly cure a



case of favus in less than six months. Thus, we occasionally see cases of fifteen or twenty years' standing, because no one has taken the pains to cure them, or because the patients are unwilling to persevere. This is especially true of dispensary practice. In the Charity Hospital I have had several such cases of favus under my care. They would be made "surface-well," and would appear all right, so that they did not want to stay longer, and would go away. During fifteen or twenty years' service at this hospital, I have seen several cases that had entered the institution on different occasions two or three years apart,—the same old cases uncured.

Favus, however, does not confine itself to the scalp. It may develop on any portion of the surface of the body. When it appears on the surface in this way, you first of all see a little red patch about half as large as a quarter-dollar. By the time it has attained a little greater size, you will see slightly yellowish or white crusts upon it. These crusts, as a rule, remain isolated. They do not tend to become so confluent as they do upon the scalp, but, as in the latter locality, they have a hair in their centres.

The disease may attack the nails, and the fungus may develop, grow, and increase under the finger-nails.

As to treatment when upon the body, all you have to do is to remove the crusts mechanically and make a few applications of tincture of iodine, and the disease will be cured.

#### TRICHOPHYTOSIS.

The next most important disease is trichophytosis. This word means literally a plant disease of the hair, or, in other words, an affection of the hair characterized by the presence of a plant,—the trichophyton. Trichophytosis, then, is an affection of the hair due to the development in the hairs themselves of a fungus known as trichophyton tonsurans. Now, this fungus in the hair consists of spores and of mycelia, but especially of spores, with a much less freely-developed mycelium than in the achorion. It affects any part of the body. When it appears upon the head it is known as *trichophytosis capitis*, or ringworm of the scalp, and is found upon the scalp and forehead; when it appears on the beard it receives the name of *trichophytosis barbæ*, and constitutes one of the forms of disease which may be contracted in barber-shops, called "barber's itch." It is also known as mentagra and sycosis. When it appears on the body or general surface it is called *trichophytosis corporis*, or ringworm of the body. There is one region which is very frequently involved, namely, the region where

the thigh and scrotum join, and there it is called *trichophytosis genito-femoralis*. In other words, it is just in the crotch where the skin is more moist than at any other point, and there we find a situation where the trichophytosis can multiply with great energy. The disease has, then, several forms, which differ from each other clinically as regards appearances, prognosis, and treatment.

On the scalp it is met with only in children. The mother will bring the child and tell you that it has been losing its hair on a certain patch. You find on the scalp a little round patch with bristles sticking out, possibly one-eighth of an inch long. If you pull out one of these hairs and examine it under an ordinary lens, you will notice that it is ragged at its ends; ragged at the external end of the hair, and commonly also at the lower end, showing first that it has been fractured above. When you undertake to pull it out it breaks off, and the inner portion remains in the follicle. Now put that hair under a microscope with a magnifying power of three hundred and fifty or four hundred diameters, and you will find that all through the shaft there are little round cells, the spores of the trichophyton. In favus you do not necessarily have involvement of the hair; in trichophytosis the shaft is involved. If you could look into the follicle itself, you would see the root of the hair down in the follicle, and the follicle itself all filled with these spores. You can readily understand from this that the disease is a difficult one to cure, in some respects more difficult than favus. In favus you can usually extract the hair complete; in trichophytosis you sometimes get out the whole of the hair, and sometimes the hair breaks and leaves a portion in.

The principles of treatment applied to trichophytosis are the same as those applied in favus,—viz., remove the hair so that you may have an empty follicle. As in favus, you take your pair of forceps and go over the scalp, carefully removing the hairs, and then apply your parasiticide lotion. At the end of a week see the case again, and the probabilities are that the broken end of the hair, which was down in the follicle, will have grown up, reaching the surface, and you will have to remove it. You will probably have to pull out the hair several times in order to get it out of the follicle completely. In this way you proceed till you have set up sufficient inflammation to destroy the lining membrane of the walls of the follicles and the whole thing is thrown off. Now the treatment considerably in vogue, and which is a good one, is to endeavor to excite inflammation of a purulent character in the hair-follicle. That can be carried out by rubbing in croton oil daily. Take one part of oil and one part of white wax and



melt them together and pour them into a little mould, and you will have a small bougie firm enough to hold in your hand. When this is applied to the surface, the warmth of the body will melt it and you can rub it into the follicles. This will excite an inflammation and you will have pustules. Pus seems to be one of the most effective poisons against the trichophyton.

When the disease affects the general surface, or when it affects the beard, you have usually at the very beginning a little red patch that increases in size while the centre seems as though healing, thus forming the ringworm. In this man, whom I show you, the disease is at the side of the neck, and is much easier to treat than if in the hair. There is only a little dryness or scaliness noticeable in the patch. As the hair-follicles are not deep, we have a superficial disease, while if it were on the side of the cheek, where the follicles are deeper and the hair is large and strong, you would have a disease much more difficult to treat. In the case before us an application of tincture of iodine, chrysarobin, or a one-per-cent. solution of bichloride of mercury will destroy all that there is. It will destroy all the fungus without epilation. On the side of the face, epilation would be necessary.

Trichophytosis of the genito-femoral region is a disease which is sufficiently common, and which in this country is usually a mild affection, but in tropical countries is really a serious disorder. With us it will be confined to the thigh and scrotum, but in tropical countries it may spread over the entire body and be almost impossible to cure. The treatment I prefer for trichophytosis genito-femoralis is rather a severe one, but I find the efficacy of it in direct ratio to the severity. There is no mild way that I know of for curing trichophytosis. I usually employ twenty grains of chrysarobin to one ounce of liquor gutta-percha, and tell the patient to apply it every day, and keep applying it till the time comes when he wishes he had never seen me. That will come usually in a week, then it is time for him to stop, and put on some soothing application. After the inflammation has subsided let him come back, and you can judge then if it be necessary to have further treatment. Generally after two or three weeks, you can bring the case to a satisfactory termination.

#### CHROMOPHYTOSIS.

I have here a second case of trichophytosis. You see on this man the characteristic margin of these lesions. In one part you see a number of circles which are distinct, and, at this other part, some circles where the margins have united. These irregular shapes are caused by

the margins of two rings coming together. Here you see a complete ring, and here are two just touching. These rings increase in size and come closer in contact. When they do so you will find that the margins of the ring disappear at the point of contact. Here the lesion is partly on the neck and partly on the scalp. But there is another thing on this man's body, *chromophytosis*.

Here in the third patient I show you a second case of the same thing. We have, then, gentlemen, two very beautiful examples of *chromophytosis*, called in some books *pityriasis versicolor*.

*Chromophytosis* appears most frequently on the chest, it appears most frequently in adults, and it appears by preference in adults who are not in good health. When I was a student, one of the books given us as text-books stated this to be a symptom of disease of the lungs. It was claimed that the affection is one of the symptoms of phthisis. It is not in any sense a symptom of phthisis, but you will very frequently find it in phthisical patients, and for that reason, Walshe, the author of the book, put it down as one of the signs of that disease. *Chromophytosis*, however, may occur in persons who, to all intents and purposes, appear perfectly healthy, as this man does. Before us are two examples of the disease occurring in perfectly sound men. Further, in the same sense that it was, as Walshe stated, a symptom of phthisis, it is also a symptom of syphilis; that is to say, if you have twenty syphilitic patients in one corner of this room and twenty patients who have no syphilis in another corner, *chromophytosis* would be apt to be found in much larger proportion among those with syphilis. In other words, *chromophytosis* seems to prefer persons suffering from a dyscrasia.

The disease at first appears as a small point, which, day after day, grows larger. At first you have simply a macule; there is no elevation. Press upon it and it does not disappear, as the spots of ordinary congestion would, showing that the color is not in the blood-vessels,—that it is not a congestion of the blood-vessels. If you examine with a lens, you may sometimes see a farinaceous desquamation. It was that fact that gave it the name of *pityriasis versicolor* in former times. The disease spreads out and tends to become more widely diffused. The spots increase in size and number, so that in time you may have the chest entirely covered with the eruption. There may be one or two large plaques, or two of these may be joined together, or you may have a large number separate. Here are fifty or one hundred in a space eight or ten inches square. The disease occurs not only on the chest but on the sides and likewise on the back. It occurs, also, on



the neck, but you don't find it on the face, nor will you find it below the inguinal region. Why does the disease spread so extensively over the chest, back, and arms, and yet not appear on the thighs or legs? The only answer is, it is the nature of it to do so; I don't know why it should be so; just as trichophytosis is found in the scalps of children but never in the scalps of adults, and yet we do not know any reason why the latter should be exempt.

Chromophytosis, due to the microsporon furfur, appears first in these small points, as I stated, which gradually increase until the disease covers more or less of the chest, back, and arms. It takes several months, and may take a year or two, before the skin is invaded to the extent you see in this case. A good many patients come to you, especially those who are not as particular as they might be in personal hygiene, and tell you that they have had an eruption, not for months but for years. This man says he has had it on and off for fourteen or fifteen years, and we can well believe that, because the disease is contagious. It is certainly contagious from one part of the skin to another on the same patient. It is much less contagious from one person to another. I have known married men who have not given it to their wives, and, by the bye, the disease is much more frequent in male than in female patients. We will see five or ten cases in males to one in females. The disease, then, though not very contagious from one to another, will, when it finds a suitable soil, spread from part to part to a certainty. The fact that it may exist for several years shows that the disease is not very easy to control. Generally, however, it is not cured because the physician either does not know how or does not take the trouble to treat it properly.

You will readily understand that the object of treatment is to remove the parasite. In chromophytosis, however, there is no earthly use in killing the fungus. What you want to kill is the epidermis,—the horny epidermis in which the fungus flourishes. Examine the epithelial cells of the horny layer, and in them you will find a little collection of round spores, and occasionally you will also see mycelium. You will readily understand that if you kill the epidermis and cause it to exfoliate, it will bring these spores with it. A very suitable application for this purpose is tincture of iodine. Another excellent one is a solution of corrosive sublimate, two grains to the ounce. But the one I prefer is chrysarobin in liquor gutta-percha, made by mixing twenty grains of chrysarobin with one ounce of "traumaticin." Paint it on every spot. You had better do it yourself, and not leave it to the patient. Then give him some of the mixture, and tell him

to apply it to every spot that you had applied it to, and any other spot that he can find on the following day, and to continue the applications daily for about a week. At the end of that time the skin will probably be in a very irritable condition, and the epidermis will begin to exfoliate. I say a week, but you may reach the point in a shorter time in some cases, while in others you may have to make ten or a dozen applications before you reach the cutaneous irritation ending in exfoliation. Now, when the epithelium begins to desquamate put the patient in a bath, with a pint of soft soap; but an attendant with a brush is much better. Wash the skin thoroughly with the soft soap, and rub it in with a scrubbing-brush, then let him wash off well and put on clean clothes. If he resume the clothes he has been wearing, he will inevitably catch the disease again. Disinfect the clothes by boiling or, as the bacteriologists say, sterilizing. This can be done in an ordinary bake-oven. His underclothes and bedclothes have to be disinfected or there will be a relapse. The patient should come back in a week, for you will readily understand that, no matter how thoroughly you have made the applications, there are some little spots that have escaped, and almost to a certainty there will be some spots too small to see with the naked eye. If at the end of a week you find fresh spots, make the applications again. Examine at the end of every week till a considerable time has elapsed. When no spots appear, you can tell him he is cured. The treatment, then, consists in destroying the epidermis, which, when it exfoliates, carries the fungus with it. In addition to that we disinfect the clothes. This treatment requires patience, and it is because of the lack of patience on the part of the physician or patient that we see these cases lasting fourteen or fifteen years. As I told you before, the disease does not appear to be very contagious from one to another, yet people get it, we don't know how. I had it myself once, and I believe I got it at a barber-shop. I discovered it myself, treated it, and was cured in a couple of weeks. I have found a number of instances where it begins on the neck, and these can be traced to the barber-shop.



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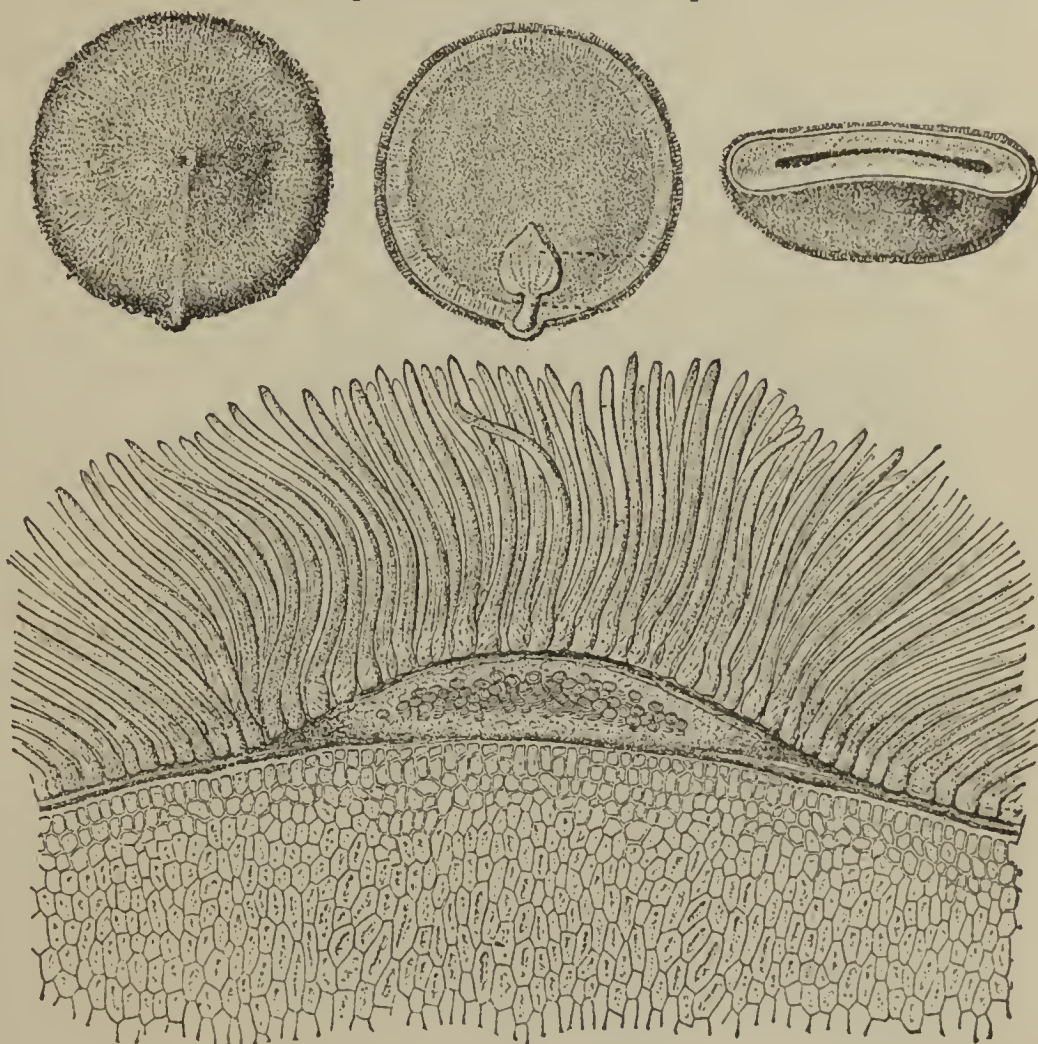
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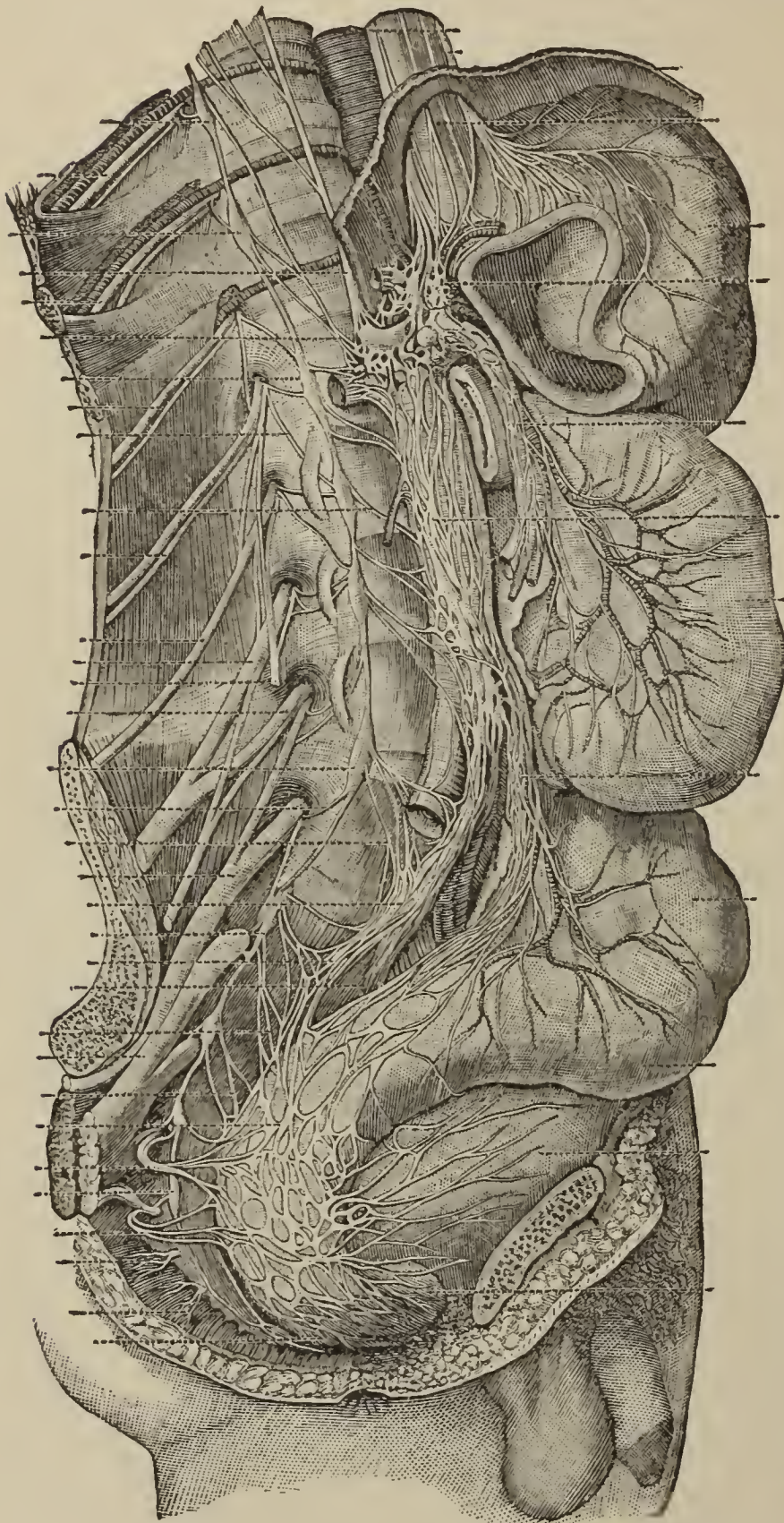
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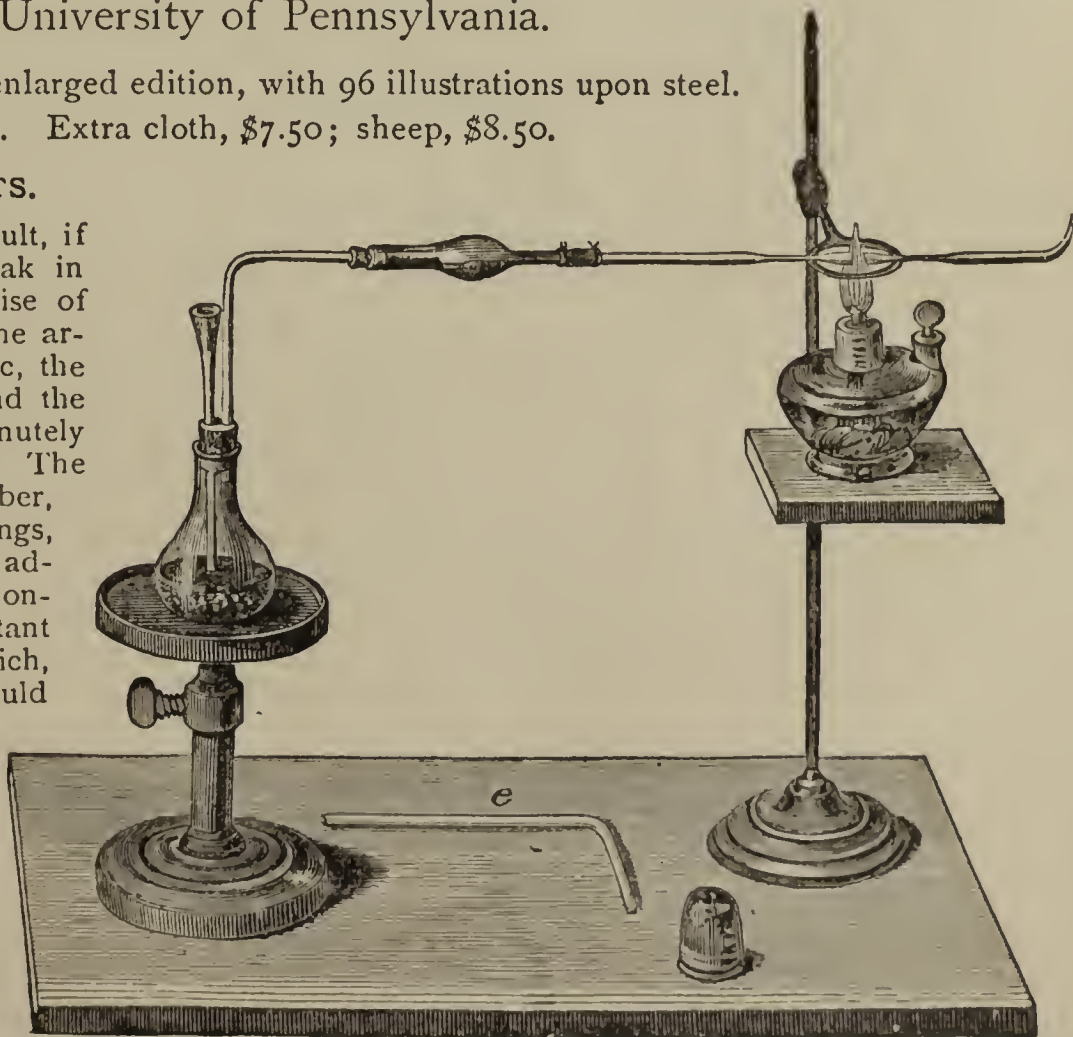
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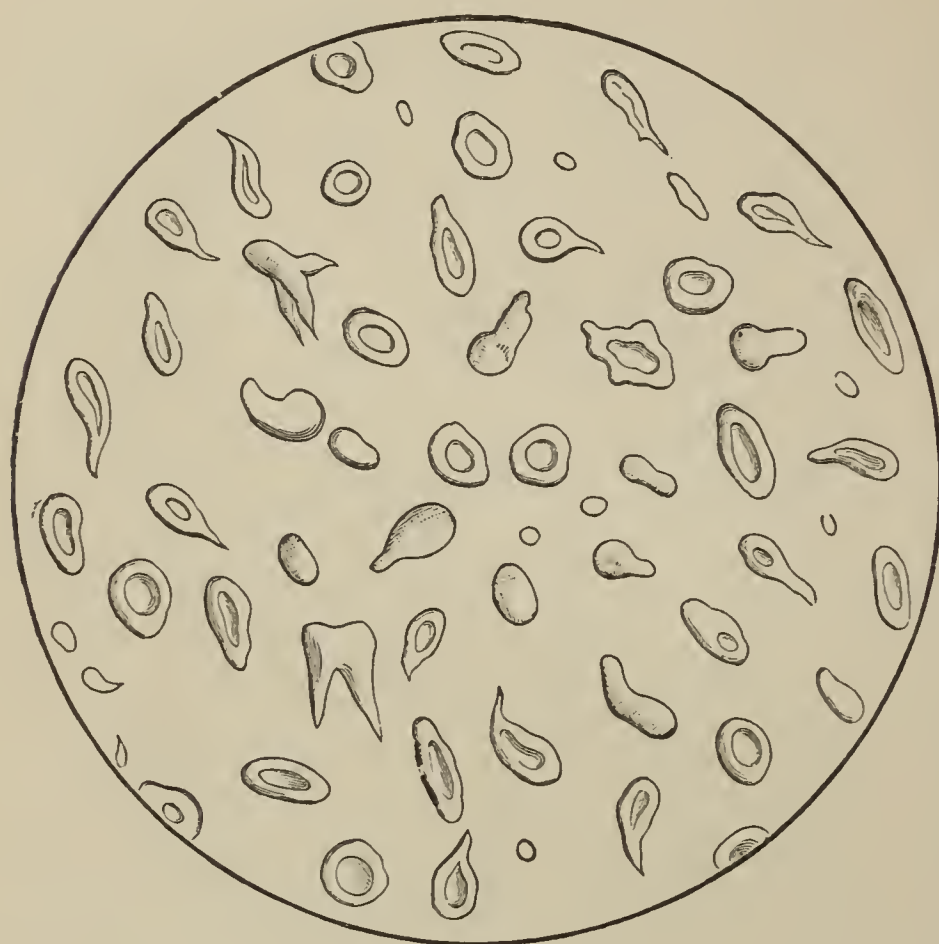
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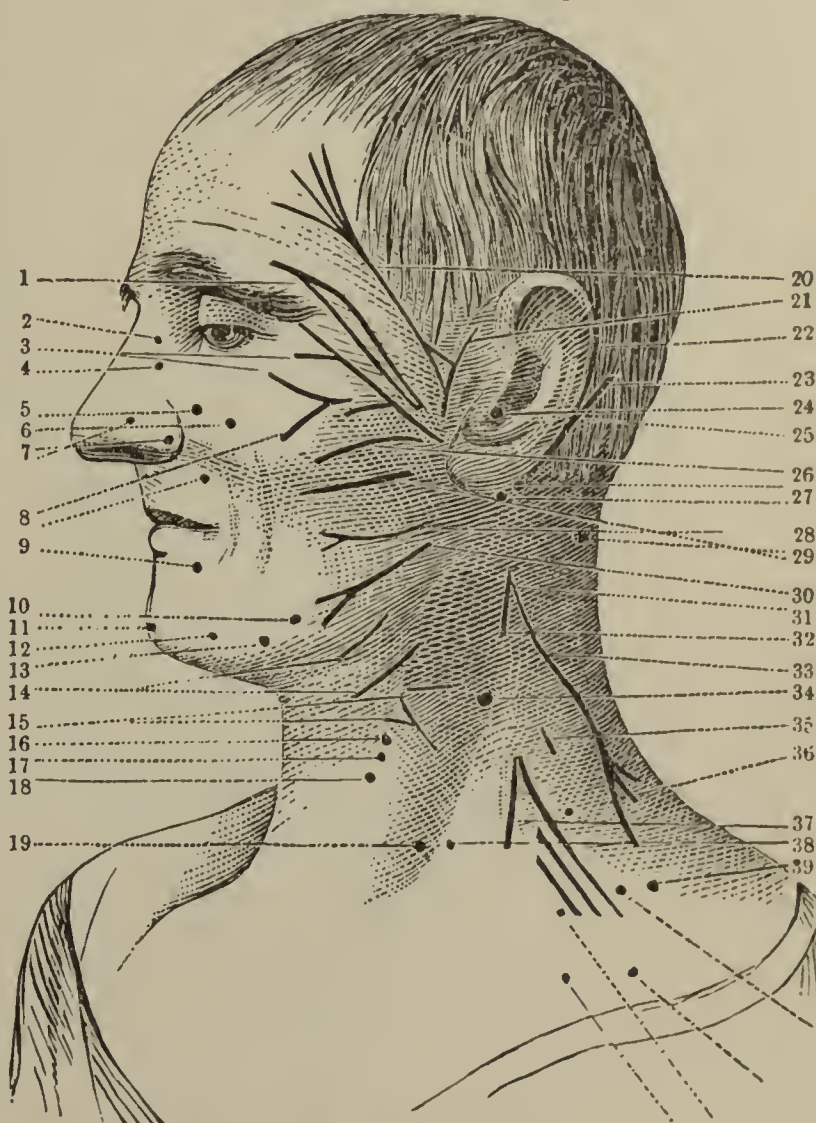


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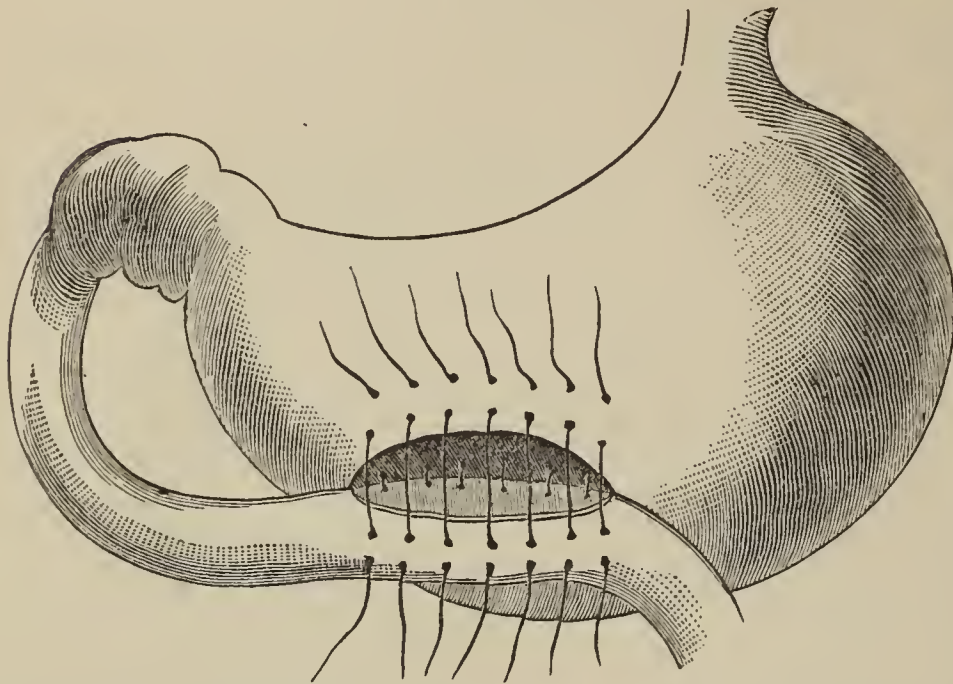
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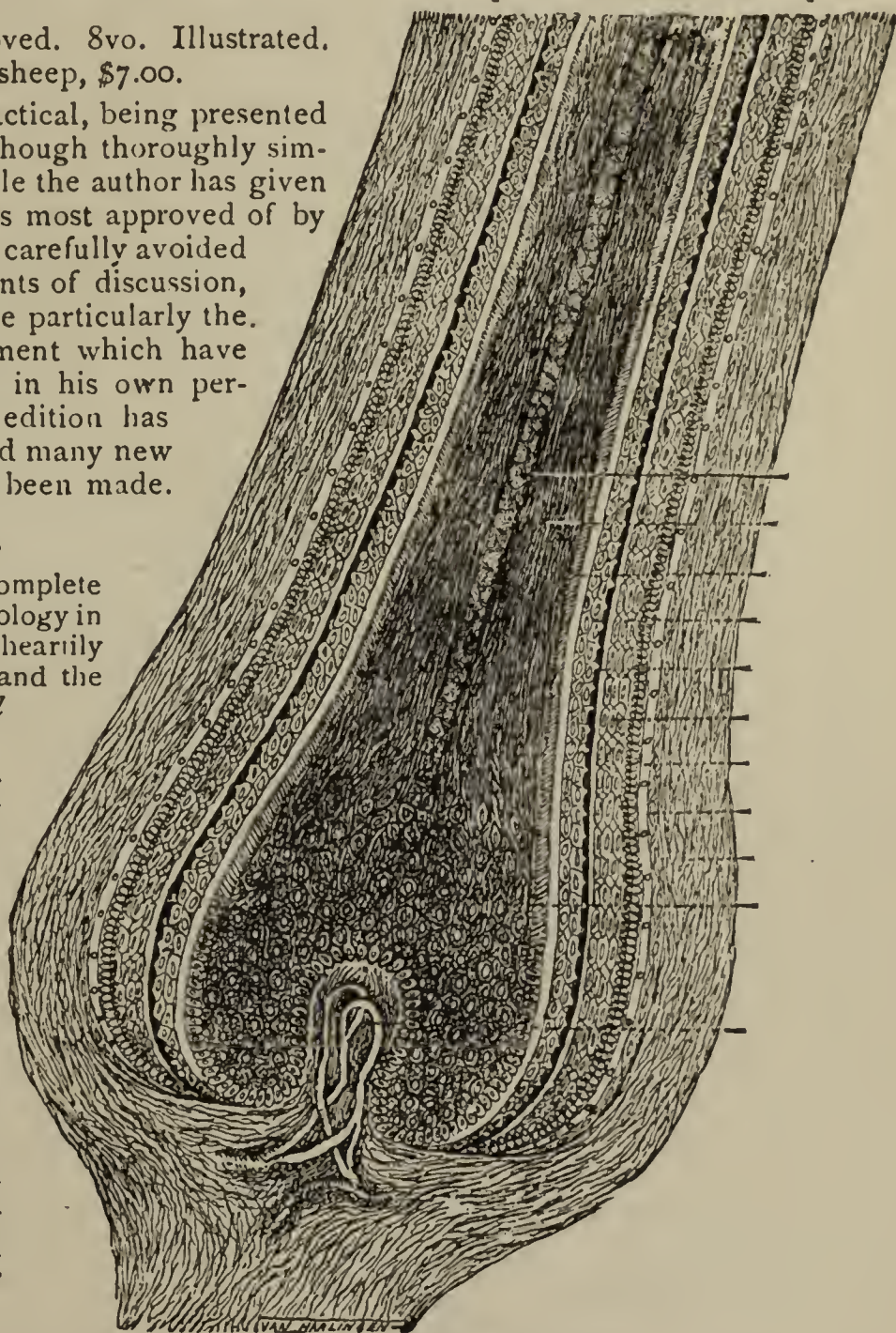


FIG. IV.—THE HAIR AND THE HAIR-FOLLICLE.

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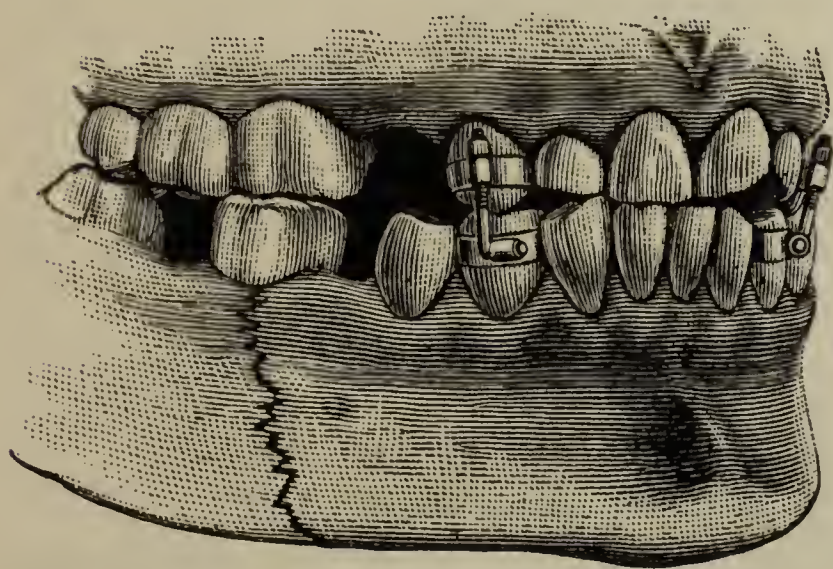
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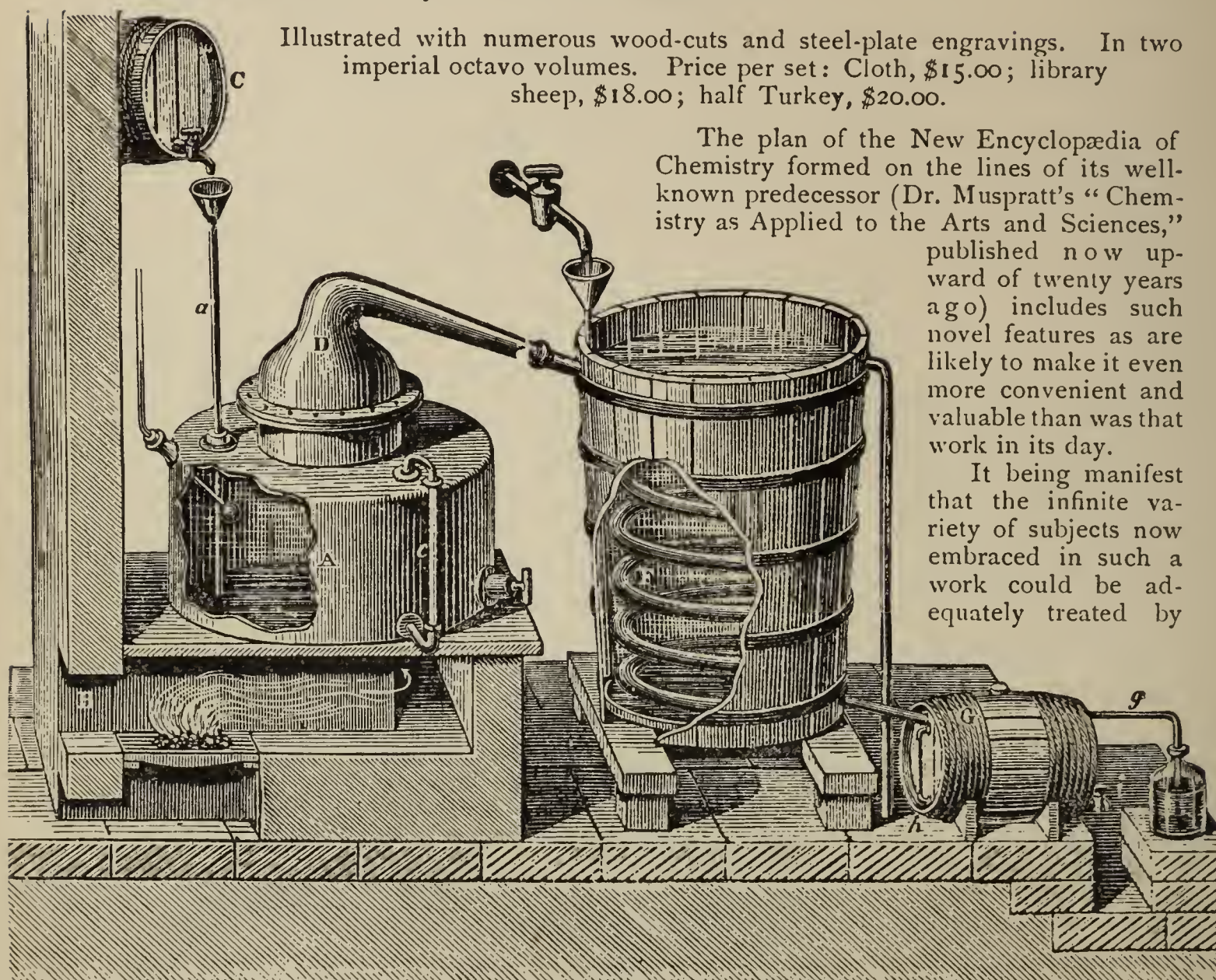


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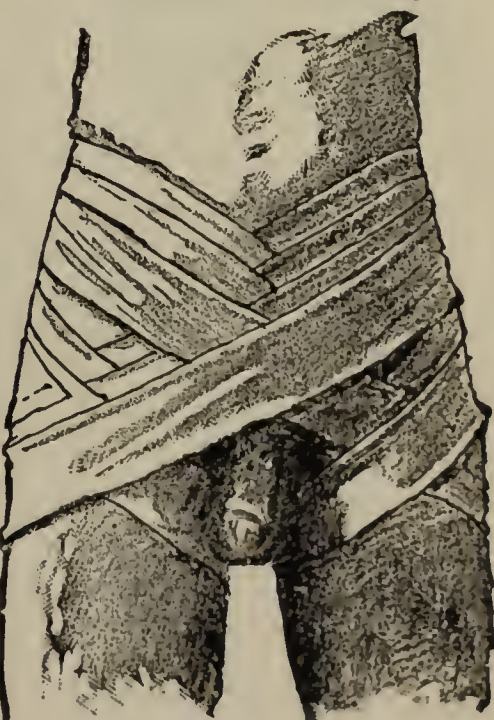
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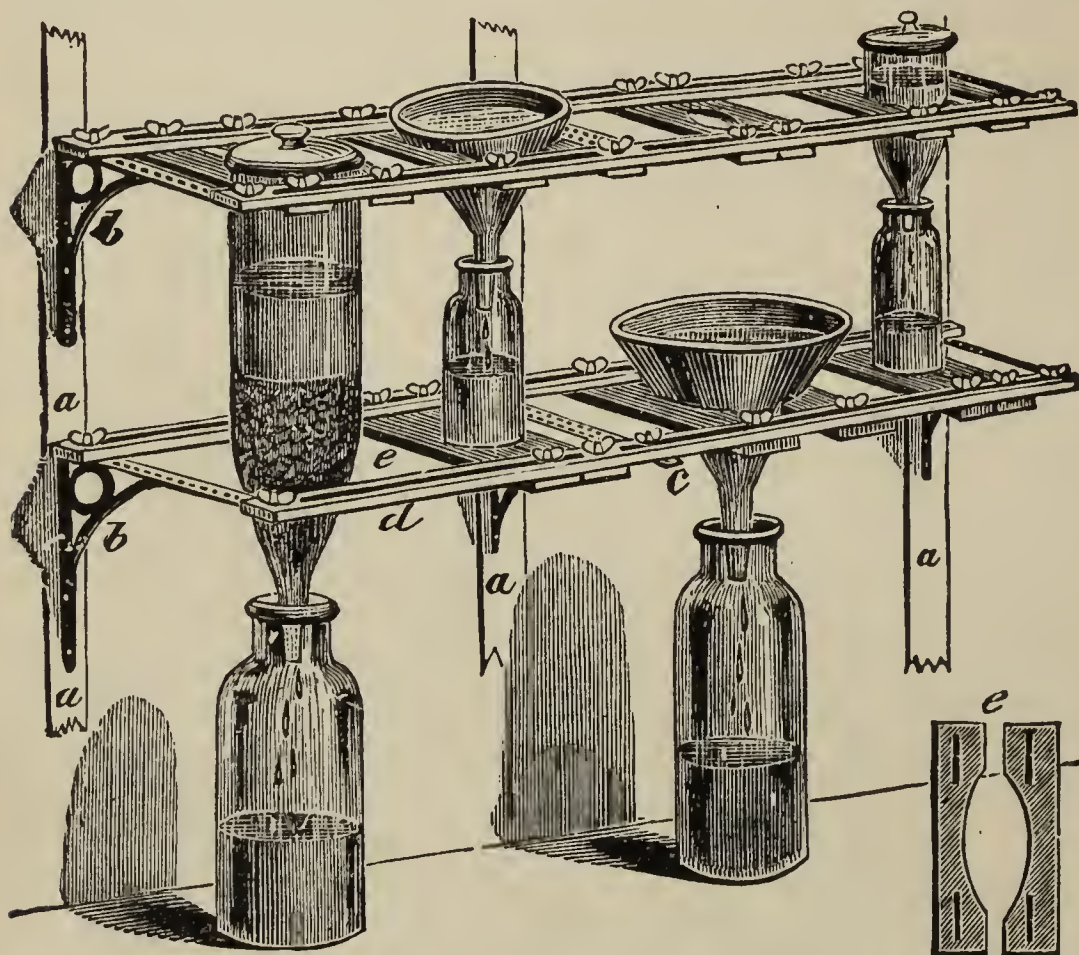


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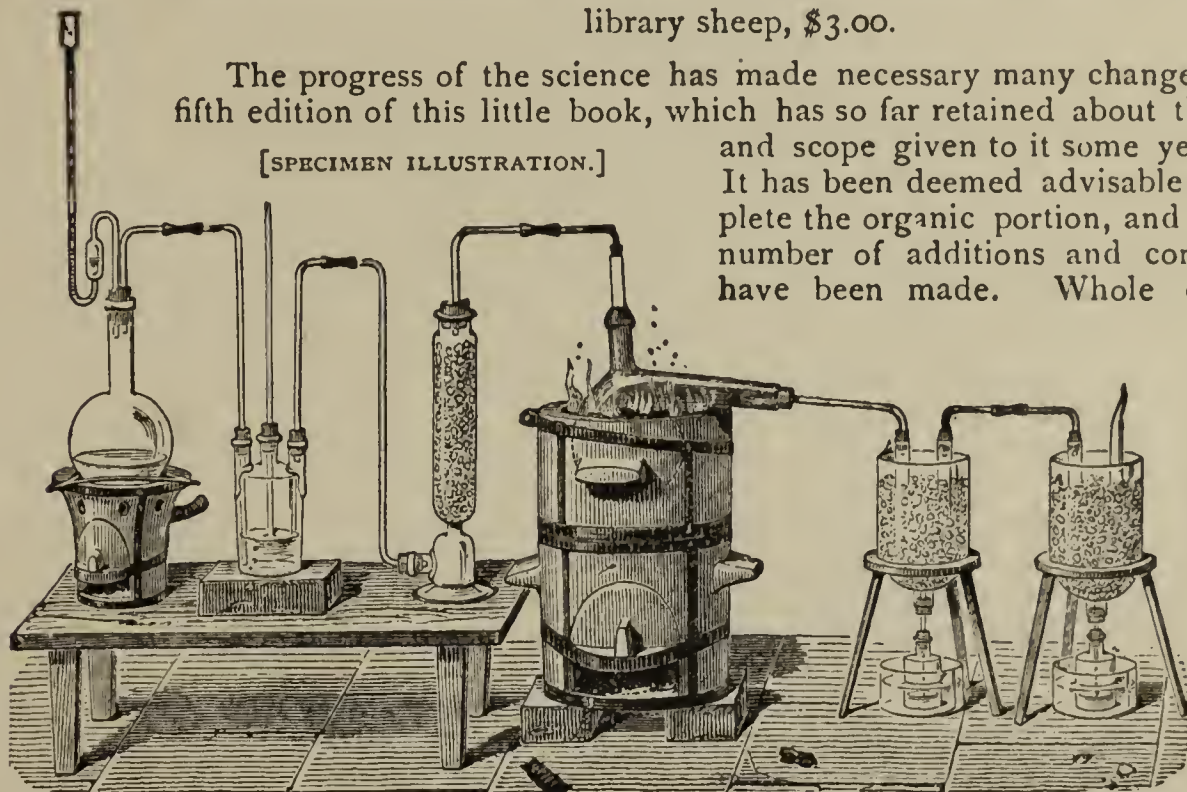


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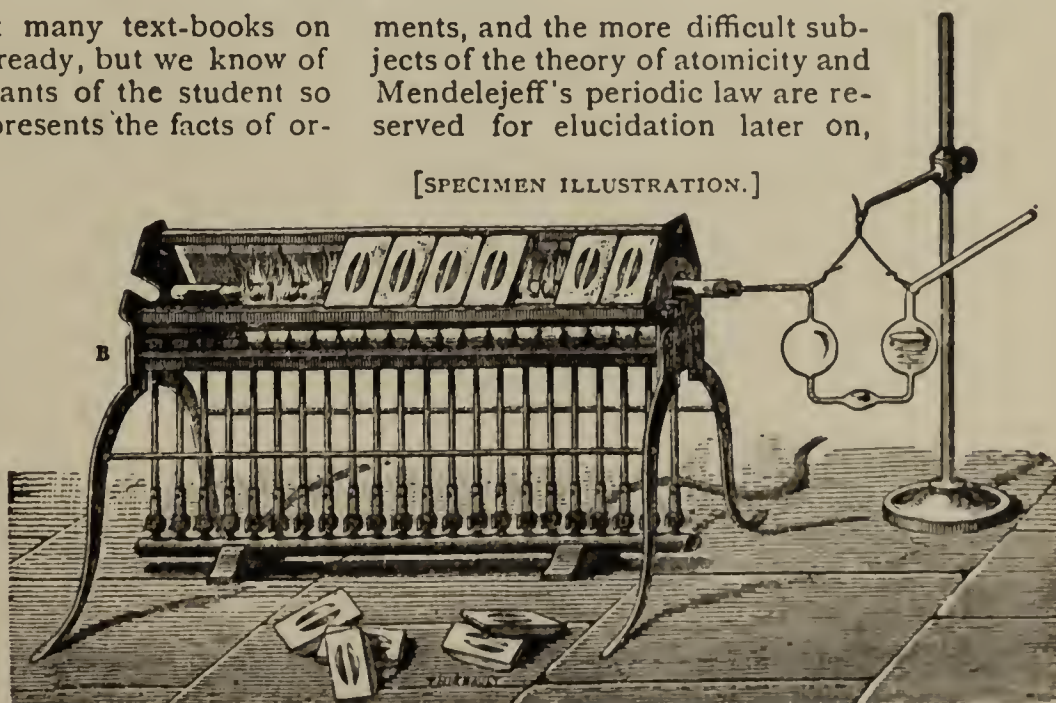
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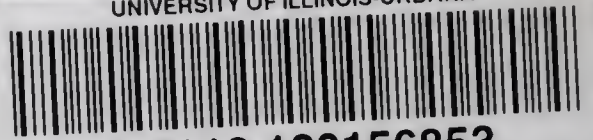








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